

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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| -----X | : | |
| UNITED STATES OF AMERICA | : | |
| | : | |
| -V.- | : | 22 Cr. 19 (PGG) |
| BRADLEY PIERRE, <i>et al.</i> , | : | |
| | : | |
| Defendants. | : | |
| -----X | : | |

**GOVERNMENT’S MOTION TO COMPEL SUPPLEMENTAL EXPERT DISCLOSURE
AND EXCLUDE PARTICULAR OPINIONS**

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PRELIMINARY STATEMENT

The Government respectfully files this motion: (1) to compel counsel to supplement the expert report of Dr. Byran Pukenas (the “Pukenas Report”) by two weeks before trial because the report fails to comply with the disclosure requirements of Federal Rule of Criminal Procedure 16(b); (2) to exclude the Pukenas’ Report’s speculative opinions about Dr. Weiner’s methodology and state of mind; and (3) to immediately disclose “clinical data” that is relied on by the Pukenas Report but has never been produced to the Government in violation of Federal Rule of Criminal Procedure 16.

FACTUAL BACKGROUND

On or about April 13, 2022, the Government produced to defense counsel a 24-page expert report by Dr. Scott Coyne setting forth his expert conclusions as to 35 MRI studies conducted by Dr. Weiner (the “Initial Report”). The Initial Report is incorporated as Exhibit A. The Initial Report methodically provides an opinion as to each of the 35 MRI studies and offers several conclusions grounded in these studies, including that Dr. Weiner falsified injuries in MRI reports. Thereafter, on or about November 15, 2022, the Government produced to defense counsel a supplemental 33-page expert report by Dr. Coyne setting forth his expert conclusions as to 65 additional MRI studies conducted by Dr. Weiner (the “Supplemental Report”). The Supplemental Report is incorporated as Exhibit B. Like the Initial Report, the Supplemental Report methodically provides an opinion as to each of the 65 MRI studies and offers several conclusions grounded in these studies, including that Dr. Weiner falsified injuries in MRI reports. Over a year later and less than a month before trial, on December 22, 2023, Weiner’s counsel produced a six-page expert report by Dr. Bryan Pukenas, incorporated herein as Exhibit

C (the “Pukenas Report”).¹ Unlike Dr. Coyne’s nearly 60 pages of expert reports, which methodically set forth his opinions as to each of the 100 MRIs at issue, the 6-page Pukenas Report does not do so for a single patient.²

RELEVANT LAW

I. Federal Rule of Criminal Procedure 16(b)

The Court’s decision in *United States v. Tuzman* sets forth the relevant law concerning the content of expert disclosures. No. 15 CR. 536 (PGG), 2017 WL 6527261, at *10–11 (S.D.N.Y. Dec. 18, 2017). Federal Rule of Criminal Procedure 16 requires a defendant to provide the Government “a written summary of any [expert] testimony that the defendant intends to use . . . as evidence at trial.” Fed. R. Crim. P. 16(b)(1)(C). “This summary must describe the witness’s opinions, the bases and reasons for those opinions, and the witness’s qualifications.” *Id.* The purpose of Rule 16 is to “‘minimize surprise that often results from unexpected expert testimony, reduce the need for continuances, and to provide the opponent with a fair opportunity to test the merit of the expert’s testimony through focused cross-examination.’” *United States v. Ulbricht*, 858 F.3d 71, 114 (2d Cir. 2017) (quoting Fed. R. Crim. P. 16, advisory committee’s note to 1993 amendment). “If a party fails to comply with Rule 16, the district court has ‘broad discretion in fashioning a remedy,’ which may include granting a continuance or ‘ordering the exclusion of evidence.’” *Id.* at 115 (quoting *United States v. Lee*, 834 F.3d 145, 158 (2d Cir. 2016)).

¹ The remainder of the disclosure sent to the document consists of nearly 23 pages of resume and a list of prior expert testimony.

² Defense counsel also disclosed, for the first time, that they intend to call an attorney as an “expert” to opine on the *Mallela* doctrine. The Government intends to file a motion excluding such testimony and will do so in a separate filing.

While “[t]he *type* of information that must be disclosed under [Rule 16(b)(1)(C)] is [] very clear[,] [t]he *quantity* and *specificity* required of the disclosure . . . is less so.” *United States v. Mehta*, 236 F. Supp. 2d 150, 155 (D. Mass. 2002) (emphasis in original). Nonetheless, where a defendant’s disclosure makes “no attempt at all to describe ‘the bases and reasons’” for an expert’s opinion, then the disclosure is deficient under Rule 16(b)(1)(C). *United States v. Wilson*, 493 F. Supp. 2d 484, 487 (E.D.N.Y. 2007). Moreover, a “general description of possible bases does not meet the requirements of Rule 16(b)(1)(C).” *United States v. Sturman*, 1998 WL 126066, at *1 (S.D.N.Y. Mar. 20, 1998). Courts have also noted that “complex testimony will require more substantial disclosures.” *United States v. Ferguson*, 2007 WL 4539646, at *2 (D. Conn. Dec. 14, 2007) (citing *United States v. Jackson*, 51 F.3d 646, 651 (7th Cir. 1995)); *see also Jackson*, 51 F.3d at 651 (indicating that Rule 16(a)(1)(E)—which requires the Government to supply the “bases and reasons” underlying its proposed expert testimony—“may require greater disclosure” in “cases involving technical or scientific evidence”); *United States v. Wilkerson*, 189 F.R.D. 14, 16 (D. Mass. 1999) (under Rule 16(a)(1)(E), “the extent of detail required . . . will depend on the nature of the expert testimony”). “[A]sserting that [an expert] will provide [an] opinion based on some unspecified method . . . , based on data from unspecified sources, does not suffice.” *United States v. Ulbricht*, 2015 WL 413318, at *6 (S.D.N.Y. Feb. 1, 2015), *aff’d*, 858 F.3d 71 (2d Cir. 2017). Where a defendant supplies a “list of tests” that the expert performed or “other experts reports he had read,” a failure to state what that expert concluded “from any individual test results . . . or expert report” renders disclosure insufficient. *United States v. Day*, 524 F.3d 1361, 1371-72 (D.C. Cir. 2008); *see also Ferguson*, 2007 WL 4539646, at *2 (disclosure about expert testimony that will rely on a certain “list of sources” is insufficient “[a]bsent information that links specific sources to each of the experts’

opinions”). The disclosure must permit more than a simple “guess as to various opinions.” *Ulbricht*, 2015 WL 413318, at *6.

II. Rule 702

Rule 702 of the Federal Rules of Evidence provides that a qualified expert's testimony is admissible only “if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.” Fed. R. Evid. 702. In assessing the reliability of expert testimony, the trial court must decide not only whether an expert's methodology is reliable for some purposes, but whether it is a reliable way “to draw a conclusion regarding the particular matter to which the expert testimony was directly relevant.” *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 154 (1999). Expert testimony that is merely “subjective belief or unsupported speculation” should be excluded. *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 590. The party proffering the expert has the burden to demonstrate that its expert witness satisfies these criteria. *See, e.g., Zaremba v. GMC*, 360 F.3d 355, 358 (2d Cir. 2004).

ARGUMENT

I. The Court Should Order Counsel to Supplement Dr. Pukenas’ Disclosure by Two Weeks Before Trial Because the Disclosure Is Deficient Under Rule 16(b)

The Court should order counsel to supplement Dr. Pukenas’ disclosure because it fails to meet Rule 16(b)’s requirements. Rule 16(b) requires the defense to produce “a complete statement of all opinions that the defendant will elicit from the witness in the defendant’s case-in-chief” and “the bases and reasons for them.” Fed. R. Crim. P. 16(b). Unlike Dr. Coyne’s nearly 60 pages of expert reports, which methodically set forth his opinions as to each of the 100

MRIs at issue, the 6-page Pukenas Report does not do so for a single patient. Instead, the Pukenas Report speaks in generalities:

I found Dr. Weiner's reports in these cases to be within the standard of care for radiologists. Further, in my review of Dr. Weiner's reports, I did not see evidence of a pattern of overreporting or exaggerating findings.

....

[A]lthough I disagreed with some of Dr. Weiner's findings, our level of disagreement was consistent with that which is reported in the literature and in line with my own experience as a practitioner. Further, to the extent that I disagreed with Dr. Weiner, it was because, in nearly equal numbers, Dr. Weiner: (i) made findings that I would not have reported; or (ii) failed to make findings that I would have reported (for example, Dr. Weiner consistently failed to report findings suggesting degeneration relating to the facet joint—a set of conditions that could cause pain, particularly if aggravated by trauma).

(Pukenas Report at 1). This disclosure is plainly insufficient to meet Rule 16(b)'s requirements.

First, the Pukenas Report does not state which of Dr. Weiner's "findings" Dr. Pukenas' agrees with, disagrees with, or the basis for such opinions. It accordingly fails both of Rule 16(b)'s requirements the disclosure provide a complete statement of all opinions that the defendant will elicit from the witness in the defendant's case-in-chief and the bases and reasons for them.

Second, without such an MRI-by-MRI analysis setting forth the information above, Dr. Pukenas' conclusion that "our level of disagreement was consistent with that which is reported in the literature and in line with my own experience as a practitioner," is unsupported conjecture. Dr. Pukenas' statement is impossible to verify if it is not specifically tied to his opinions as to each MRI report. Third, the Pukenas Report opines that "there are still variations in terms of how sensitive and specific a radiologist will be when detecting and describing findings that should be included in a report" and "[t]hat variation is evident in comparing Dr. Coyne's reads to Dr. Weiner's." (*Id.* at 2). The Pukenas Report nonetheless does not state *what* these variations are

with regard to each report beyond describing a “stylistic reporting difference[.]” in a single patient, “W.J.” (*Id.* at 3).

This lack of specific analysis as to each MRI scan makes it impossible for Dr. Coyne to opine on Dr. Pukenas’ conclusions because Dr. Coyne *does not know* the Pukenas Report’s bases and reasons. The Pukenas Report simply consists of a handful of “examples” without setting forth his full opinion as to each report. By contrast, Dr. Pukenas had all of Dr. Coyne’s opinions about each MRI scan and clearly relied on them in preparing his own opinion. (*See, e.g., id.* at 1 (“I was also asked to examine independently each of the radiological examinations and reports that Dr. Weiner conducted of the persons identified in the Report and Supplemental Report of Dr. Scott S. Coyne, and to assess independently Dr. Coyne’s evaluations of Dr. Weiner’s reports (including his methodology).”)). Simply put, “the government is entitled to reciprocal discovery under Rule 16, in order to ensure that the government will be able to prepare a ‘focused cross-examination’ of defendant’s expert testimony—just as the defense has been able to use the summary provided by the government in preparing a ‘focused cross-examination’ of the government’s expert witness.” *United States v. Jasper*, No. 00 CR. 825(PKL), 2003 WL 223212, at *5 (S.D.N.Y. Jan. 31, 2003).

Indeed, the facts here are akin to those in the Court’s decision in *Tuzman*. There, the defendant’s proposed expert sought to opine on the date of ink used in certain handwritten materials using Gas Chromatography/Mass Spectrometry (“GC/MS”) testing. 2017 WL 6527261, at *11. The Court found that the expert’s disclosure was inadequate because “while Tuzman’s disclosure discussed generally what GC/MS testing can show, how it is used, and when it is used, Tuzman did not disclose—aside from Dr. Lyter’s use of the micro plug technique—what Dr. Lyter did (1) to prepare the samples for testing; (2) with the samples during

testing, or (3) to ensure accuracy (internal citations omitted).” *Id.* The Court further found that “[i]t was not sufficient to disclose Dr. Lyter’s baseline conclusions that certain results were ‘inconsistent’ with preparation during the period of the alleged fraud; rather, Tuzman needed to disclose the formulas or calculations that Dr. Lyter used to reach his conclusions.” *Id.*

The same principles apply here. The Pukenas Report broadly states that Dr. Weiner’s MRI reports were “consistent” with accepted medical practice without disclosing the methodology that he used to reach his conclusion—namely, an MRI-by-MRI analysis. The Government produced Dr. Coyne’s 60 pages of expert reports over a year ago to permit defense counsel to produce such an MRI-by-MRI analysis (and meet their obligations under Rule 16(b)). Defense counsel nonetheless delayed to less than a month before trial to make their expert disclosure, and it is plainly insufficient. The Court should order counsel to supplement the Pukenas Report with an MRI-by-MRI analysis—as the Government has done with Dr. Coyne over a year ago—and explain how his level of disagreement with these MRIs is “consistent with that which is reported in the literature and in line with my own experience as a practitioner.” (Pukenas Report at 1). The Court is aware that question of whether Dr. Weiner falsified injuries is at the core of this case, and the Government is entitled to the same level of disclosure that it provided defense counsel. The Government requests that counsel produce these opinions by December 4, 2023 (two weeks before trial) because the Government intends to file a *Daubert* motion challenging the admissibility of Dr. Pukenas’ conclusion that “Dr. Weiner’s practice of describing findings is consistent with the standard of care.” (*Id.* at 2).

II. The Court Should Preclude Dr. Pukenas from Speculating About Dr. Weiner’s Methodology for Preparing MRI Reports

The Court should next preclude Dr. Pukenas from speculating about Dr. Weiner’s methodology for preparing MRI reports. The Pukenas Report opines that Dr. Weiner had access

to specific “clinical data” that Dr. Coyne lacked, which caused the two physicians to disagree about the presence of injuries. (Pukenas Report at 2). Dr. Pukenas does not define what this “clinical data” is, and defense counsel has failed to produce this information to the Government in violation of Federal Rule of Criminal Procedure 16. *See Infra* Section III. Dr. Pukenas nonetheless speculates that because Dr. Weiner had *access* to such data, he must have used it, and his “use of clinical data appears to have resulted in more appropriate diagnoses in certain instances.” (*Id.*). As an example of such speculation, Dr. Pukenas states that “in one case of a 16-year-old girl reporting lower back pain, N.B., Dr. Weiner’s use of clinical data likely led him to find and report an issue that both Dr. Coyne and another radiologist in Dr. Weiner’s office missed.” (*Id.*). Dr. Pukenas further speculates that “[f]raming bias may also help to explain some of the differences of opinion between me and Drs. Weiner and Coyne, respectively” because “Dr. Weiner interpreted these MRIs in a clinical context where patients complained of pain following trauma,” while “Dr. Coyne interpreted these MRIs after the fact, without clinical data, at the request of law-enforcement authorities.” (*Id.* at 5 n. 8).

Dr. Pukenas’ speculation about Dr. Weiner’s use of “clinical data” is inadmissible. Dr. Pukenas does not know whether Dr. Weiner actually reviewed the “clinical data”—as opposed to just the MRI scans—while preparing the 100 MRI reports at issue. Dr. Weiner’s reports do not state that he reviewed such data or, if he did, what specific data he reviewed.³ Dr. Pukenas, in turn, does not claim to have interviewed Weiner about his “methodology” because such interview statements would themselves be inadmissible hearsay. Moreover, even if Dr. Weiner had reviewed this clinical data, Dr. Pukenas’ opinion that this explains particular findings in MRI

³ The fact that the reports have a boilerplate statement, “PAIN STATUS POST INJURY,” is not to the contrary. The Government will introduce testimony that *all* Nexray’s patients reported pain post injury, and this boilerplate is present on every report.

reports—absent a clear statement by Dr. Weiner in the report—is pure, inadmissible speculation about Dr. Weiner’s state of mind.

The example of patient N.B. proves the point as to why such speculation should be excluded. The evidence at trial will show that another physician (Dr. Barbara Moriarty) initially interpreted N.B.’s MRIs and found that there was no evidence of injury to her lumbar spine. Dr. Moriarty will testify that her report is accurate and that she also had access to clinical data prior to coming to her conclusion. The evidence will further show that Weiner thereafter addended Dr. Moriarty’s report—without telling her—to falsify injuries. Moreover, although Dr. Weiner’s report stated that N.B. “continues to experience intense pain and radiculopathy,” the Government will introduce text messages and phone records showing that Weiner *did not* consult the “clinical data” prior to making the addendum but rather included this statement in response to a message from Bradley Pierre. Bradley Pierre further told Weiner that “We need to fix these situations,” after which Weiner responded, “It’s unlikely a 16 year old has much going on But I’ll look.” Weiner then addended N.B.’s report barely an hour later without making a single phone call. Thus, Dr. Pukenas’ speculation about *why* Dr. Weiner addended N.B.’s report—*i.e.*, that “Dr. Weiner’s use of clinical data likely led him to find and report an issue that both Dr. Coyne and another radiologist in Dr. Weiner’s office missed,” (Pukenas Report at 2)—is nothing more than unfounded speculation. If Dr. Weiner wishes to testify about his “methodology” as a physician, why he addended N.B.’s report, and his reasons for doing so, he is free to testify in his own defense. However, speculation by another physician is not an admissible substitute. *See, e.g., Est. of Ratcliffe v. Pradera Realty Co.*, No. 05 CIV. 10272 (JFK), 2008 WL 53115, at *5 (S.D.N.Y. Jan. 2, 2008) (excluding an expert’s opinions as “speculative and unsupported by a sufficient evidentiary foundation” when they were based on a “guess about what happened” when the

expert was not present, rather than “sufficient facts or data”, as required of expert testimony.); *Brooks v. Outboard Marine Corp.*, 234 F.3d 89, 92 (2d Cir. 2000) (affirming exclusion of expert testimony where the expert “had never seen the actual boat or motor either in person or in photographs, had never spoken to either of the boys involved in the accident, was unaware of the dimensions of the boat and the placement of the seats in relation to the motor, did not know precisely what happened and where the boys were positioned in the time immediately preceding the accident, and had never attempted to reconstruct the accident and test his theory”).

III. The Court Should Order Counsel to Immediately Disclose the “Clinical Data” Discussed in the Pukenas Report

Lastly, the Government requests that the Court immediately order counsel to disclose to the Government the “clinical data” discussed in the Pukenas Report.⁴ The law is clear that “[i]f proposed expert testimony is based on a ‘review and analysis of scientific, medical and other peer reviewed literature,’ the defendant must supply the literature upon which the expert will rely.” *Tuzman*, No. 15 CR. 536 (PGG), 2017 WL 6527261, at *11 (quoting *United States v. Chase*, 2005 WL 6733654, at *16-17 (D. Vt. Sept. 16, 2005)). The Government has requested reciprocal disclosures for over a year, and the defense should have disclosed this “clinical data” the moment that they supplied it to their expert for review. The Government is entitled to have Dr. Coyne review this data as part of his analysis, and the fact that defense counsel has failed to produce it to the Government is inappropriate gamesmanship in violation of Rule 16. *See Ulbricht*, 858 F.3d at 114 (the purpose of Rule 16 is to “‘minimize surprise that often results from unexpected expert testimony, reduce the need for continuances, and to provide the

⁴ Defense counsel produced their expert reports at approximately 8:33pm on December 22, 2023, less than 4 hours before the Court-imposed deadline. The Government immediately responded to ask for disclosure of the unproduced “clinical data.” Defense counsel has yet to even acknowledge the Government’s request.

opponent with a fair opportunity to test the merit of the expert’s testimony through focused cross-examination.” (quoting Fed. R. Crim. P. 16, advisory committee’s note to 1993 amendment)).

CONCLUSION

For the foregoing reasons, the Court should grant the Government's motion in its entirety.

Dated: New York, New York
December 24, 2023

Respectfully submitted,

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By: _____
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Exhibit A

March 11,2022

Scott S. Coyne M.D.

File 204425-41RA1/2

Expert Diagnostic Radiology Review

To whom it may concern:

I have carefully performed an independent expert review of 40 MRI exams, composed of 28 lumbosacral spine and 12 cervical spine studies in patients of ages 16 to 68 years old. The studies were randomly selected and presented for my review without medical records or specific history of clinical presentation. The technical quality of these MRI studies was acceptable for diagnostic assessment. The methodology for my review consisted of a detailed initial assessment of all the images in each study and formulation of diagnostic radiology opinions. I then reviewed the respective radiology report from Soul Radiology, and recorded my specific agreement or disagreement with the opinions stated in the radiology report of the particular exam.

All of these patients were referred for MRI assessment following trauma, with an identical indication for each exam, "Indication: Pain Status Post Injury". My review of these cases revealed an excessive number of discrepancies between the anatomy displayed on the MRI images and the facility radiology reports which, in most cases, provided diagnoses such as central, paramedian, right and left disc herniations, nerve root abutment, impingement, encroachment into the neural foramen/foramina, pressure on the CSF column, mass effect on the spinal cord, at one or more specific levels, which were findings not displayed on the images of the respective MRI exam. As described herein, these represent false positive diagnoses.

In 39 of 40 cases my opinions were in substantial disagreement with the diagnostic findings contained in the radiology reports; I agreed with the interpretation in only one report. In addition to these many false positive diagnoses, in other cases, there was also a failure to describe an important underlying degenerative condition as the cause of radiologic findings. Failure to describe certain findings as degenerative in nature, could and most probably would mislead the referring clinician to erroneously assume that the findings were posttraumatic, particularly because all of these MRI studies were performed for assessment following trauma. By way of background, degenerative disc and facet joint pathology is a universal condition which basically affects individuals to different degrees, and progresses with age. It is a variable condition which typically can be seen on MRI during the 3rd decade (20-30 years) as mild degenerative change, which progresses over the years, becoming mild to moderate in the 30 and 40-year-olds, more pronounced in the 50-year-olds, and often could become severe as a clinically significant and symptomatic condition in the later years.

The specific results of my review can be subdivided into the following 3 main categories:

1. Normal MRI Examination
2. Mild Degeneration, e.g. minimal disc dehydration, slight annular bulging, as isolated findings without other change
3. Moderate to Advanced Degenerative Pathology, variable degrees of annular disc bulging, disc protrusion, diminished disc height, disc dehydration, degenerative narrowing neural foramen and central spinal canal, osteophyte formation

Scott S. Coyne M.D.
 --Expert Review Continued--

In Category 1 there were 9 patients with completely normal MRI studies. However in every one of these cases the radiologist reported that there was a disc herniation, and in half of the cases disc herniations at more than one level, with narrowing of the neural foramina and nerve root abutment (compression). Notably, in one of these cases, a 16-year-old patient underwent a lumbosacral spine MRI exam, and the initial radiologist at the facility issued the report as a basically normal study with no evidence of disc herniation, with which I agreed. However, another radiologist at the same facility subsequently amended the initial report and provided a 2nd written report, essentially indicating that the original report was in error, and stated that there were disc herniations at 2 levels with narrowing of the neural foramina, findings which I found were not at all supported on the images. Parenthetically I would add that a herniated disc is an extremely rare finding in a 16-year-old patient.

In Category 2 (mild degeneration) there were 16 patients. I agreed with the report in 1 MRI study. In the other 15 studies the MRI images simply demonstrated very mild degenerative disc changes with no other pathology. However, in these 15 MRI exams the radiologist of record reported disc herniations, and in 9/15 reported disc herniations at more than one level, some with narrowing of the neural foramina, and nerve root and thecal sac/spinal cord compression. There were no anatomical findings on these MRI examinations to support these opinions.

In Category 3 there were a total of 15 cases. In many of these examinations I agreed that there were degenerative findings with disc bulging, slight herniation/protrusion, narrowing of the neural foramina, etc. However, the radiologist described additional herniated discs and narrowed neural foramina at levels where the respective MRI images did not display those findings. As described in other categories in this review, herniated discs and related pathology were also reported at more than one level, which were findings not supported on the MRI images. Notably, in several cases, the radiologist reported more than one disc herniation at the same anatomic level in the same exam, and in 3 of these cases reported 3 disc herniations at the same anatomic level. In other cases, the radiologist also reported "anterior" disc herniations, which by location are typically not a diagnostic entity included in spinal radiology reports. Anterior disc herniation is an extraneous finding because the major neuroanatomical structures of importance, the nerve root, spinal canal, spinal cord/cauda equina are all posteriorly located structures and, therefore, are not affected by the anterior aspect of the intervertebral disc. Anterior disc herniation basically represents exaggerated reporting of a neurologically insignificant finding.

The description and diagnoses of multilevel disc herniations impinging on the nerve roots and encroaching into the neural foramina and central canal without any discussion or even reference to the major finding of significant pre-existing degenerative pathology, which in some cases was quite advanced, is seriously deficient and misleading. Such omission clearly could and most probably would mislead the referring clinician to assume that the various radiologic findings were a result of trauma, particularly because these MRI examinations in every case were specifically performed for assessment following trauma.

Scott S. Coyne M.D.

--Expert Review Continued--

In many cases, the radiologist described straightening of the lordotic curvature, which was not present on the images.

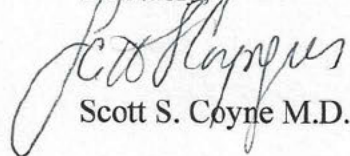
CONCLUSION:

My detailed review of these cases demonstrated an overwhelming number of false positive diagnoses, and a clear pattern of false radiologic reporting of clinically significant diagnoses and other findings not present on the MRI images. Many of the reports were also misleading, particularly in the setting of trauma assessment, for failing to mention the degenerative condition as a cause for the reported findings, as well exaggerated reporting of "anterior" disc herniation.

The respective reports of these MRI examinations represent substantial departures from accepted standards of care in diagnostic radiology interpretation and communication.

The radiology reports of these cervical and lumbosacral spine MRI examinations would lead to erroneous *clinical* diagnoses and decisions, resulting in unnecessary clinical diagnostic procedures, such as EMG, nerve conduction and other diagnostic studies, as well as unnecessary treatment including decisions for pain management, interventional procedures, and even major spinal surgery.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott S. Coyne", is written over the word "Sincerely,". The signature is fluid and cursive.

Scott S. Coyne M.D.

See Appendix 1 (attached) for detailed assessment of each MRI examination

Scott S. Coyne, M.D.

Diplomate of the American Board of Radiology

March 11, 2022

APPENDIX 1 (File 204425-41RA1/2)

Expert Review Interpretations of Cervical Spine and Lumbosacral Spine MRI Examinations

M [REDACTED], M [REDACTED] Date of Birth: December 18, 1989 (29 years), "Pain status post injury"
Lumbosacral Spine MRI January 8, 2019 @ Soul Radiology (labeled, 'M [REDACTED], M [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. The discs are all normal in height, signal and morphology. There is no evidence of disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordotic curvature is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ Agree: L3 hemangioma (did not mention S1 hemangioma)

➤ DISAGREE:

1. Straightening of the physiologic lordosis consistent with pain and/or spasm
2. L3-4 right lateral disc herniation narrowing the foramen and abutting the nerve root
3. L4-5 right paramedian disc herniation impressing on the ventral surface of the thecal sac with its associated nerve roots

S [REDACTED] Z [REDACTED] Date of Birth: December 1, 1991 (27 years), "Pain status post injury"
Cervical Spine MRI January 8, 2019 @ Soul Radiology (labeled, 'S [REDACTED] Z [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative disc changes, mainly at C4-5 and C5-6 with slight disc dehydration and shallow annular bulging which is developmentally normal. There is no osteophyte formation or diminished disc height. The discs are otherwise normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the spinal cord at any level. The central spinal canal and neural foramina are widely patent at all levels. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ Agree: Straightening to Slight Reversal of Lordosis (but may be positional, not from spasm)

DISAGREE:

1. C5-6 central disc herniation impressing CSF column
2. C6-7 "some right paramedian and right lateral disc herniation narrowing the neural foramen"

A [REDACTED] R [REDACTED] Date of Birth: May 31, 1984 (34 years), "Pain status post injury"
Lumbosacral Spine MRI January 16, 2019 @ Soul Radiology (labeled, 'A [REDACTED] R [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are degenerative facet joint changes, mainly at L4-5 and L5-S1. There are focal and relatively isolated degenerative disc changes at L3-4, L4-5 and L5-S1 characterized by disc dehydration, moderate annular bulging, and marginal anterior and posterior osteophyte formation. The discs are otherwise relatively normal in height, signal and morphology. There is a prominent left paracentral protrusion of the L4-5 disc which effaces the epidural space, marginally impresses the central left cauda equina. There may be a tiny central L3-4 disc protrusion which also mildly compresses the cauda equina. There is no evidence of disc extrusion at any level. There is degenerative narrowing of the L4-5 neural foramina, left side slightly more than right. The central spinal canal and neural foramina are otherwise patent at all levels. Mild straightening of lordosis is demonstrated. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- Agree: L3-4 central disc herniation with some increased signal and herniated material consistent with annular tear, was impression on the thecal sac
- At L4-5 Central Left Paramedian Disc Herniation Impresses on the Central and left side of the thecal sac and associated nerve roots
- Straightening of the physiologic lordosis consistent with pain and/or spasm (no mention of position as possibility)
- DISAGREE:
 1. Redundant statement, "at L4-5 there is also left lateral disc herniation impinging on the nerve root at the origin of the foramen".
 2. At L5-S1 central herniation impressing on portions of the cauda equina

B [REDACTED], N [REDACTED] Date of Birth: January 27, 2003 (16 years), "Pain status post injury"
Lumbosacral Spine MRI February 23, 2019 @ Soul Radiology (labeled, 'B [REDACTED], N [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is mild patient motion artifact, but the examination is diagnostic. There is no fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. Small focal signal change of L3 vertebral body is consistent with hemangioma. The discs are all normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordotic curvature is normal and well-preserved. There probably is a shallow scoliosis. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

Initial report authored by Barbara Moriarty MD

- Agree: "No focal abnormality impresses on the thecal sac"
- DISAGREE:
 - Straightening of the physiologic lordosis consistent with pain and/or spasm

(cont.) B [REDACTED], N [REDACTED] Date of Birth: January 27, 2003 (16 years)

Addendum Report on February 27, 2019 authored by William Weiner MD

"The patient continues to experience intense pain and radiculopathy". Review of the examination demonstrates that at the L3-4 level there is a focal right lateral disc herniation abutting the nerve root at the origin of the foramen. At L4-5 there is a focal right lateral disc herniation narrowing the origin of the foramen. There is no nerve root abutment or impression at this level".

➤ DISAGREE

1. L3-4 focal right lateral disc herniation abutting the nerve root at the origin of the foramen
2. L4-5 focal right lateral disc herniation narrowing the region of the foramen

T [REDACTED] L [REDACTED] Date of Birth: May 23, 1986 (31 years), "Pain status post injury"

Lumbosacral Spine MRI May 1, 2018 @ Soul Radiology (labeled, 'L [REDACTED], T [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild, age-appropriate degenerative facet joint changes at L4-5 and L5-S1, left side slightly more than right. There are very mild, uniform, age-appropriate degenerative disc changes characterized by disc dehydration, minimal osteophyte formation and shallow annular bulging. The discs are otherwise normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordotic curvature is normal and well-preserved. The cauda equina is normal in signal and diameter. The nerve roots are well defined and are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

"At L5-S1 there is some left lateral disc herniation narrowing the foramen and impinging on the nerve root"

S [REDACTED] M [REDACTED] Date of Birth: July 28, 1990 (27 years), "Pain status post injury"

Cervical Spine MRI May 1, 2018 @ Soul Radiology (labeled, 'S [REDACTED] M [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no osseous trauma, fracture, contusion, dislocation, subluxation or other acute pathology. Vertebral column and facet joint alignment are normal. There are mild, age-appropriate multilevel degenerative disc changes, slightly more pronounced at C5-6 and C6-7 than other levels, characterized by disc dehydration, minimal annular bulging which is developmentally normal and marginal osteophyte formation. Except for minimal loss, the disc heights are relatively well-maintained. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the spinal cord at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal. The spinal cord is normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- DISAGREE: C4-5 and C5-6 central disc herniations impressing on the CSF column with secondary mass effect on the spinal cord

S [REDACTED] W [REDACTED] Date of Birth: April 26, 1966 (52 years), "Pain status post injury"
Cervical Spine MRI May 7, 2018 @ Soul Radiology (labeled, 'S [REDACTED] W [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other acute trauma. Vertebral column and facet joint alignment are normal. There are multilevel degenerative facet joint changes. There are also multilevel degenerative disc changes, which are markedly advanced at C5-6 and C6-7 characterized by substantial disc dehydration, hypertrophic osteophyte formation, substantially diminished disc heights and mild Modic vertebral endplate changes indicating long-standing degenerative disease. There is a large right paracentral disc (protrusion)-osteophyte complex which results in substantial narrowing of the right C5-6 neural foramen. Smaller disc osteophyte complexes are noted at the left C5-6 and bilateral C6-7 levels which result in mild to moderate narrowing of the adjacent neural foramina. There is mild degenerative narrowing of the left C3-4 and bilateral C4-5 neural foramina. There is no evidence of focal disc extrusion, or significant spinal cord compression or displacement at any level. There is mild degenerative narrowing of the C5-6 central spinal canal. The central spinal canal is otherwise patent. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- Agree: C5-6 spondylosis with anterior osteophyte disc complex, but "disc material extending beyond the osteophyte and bowing the anterior longitudinal ligaments is exaggerated, as it is part of the hypertrophic osteophyte complex. It does not represent a singular pathologic entity.
- Straightening of physiologic Lordosis (but may be positional, not decisively from pain/spasm)
- DISAGREE:
 1. C3-4 left lateral disc herniation with disc material extending beyond the osteophyte and abutting the nerve root within the foramen
 2. C5-6 is a huge disc-osteophyte complex and isolating one from the other (i.e. disc from osteophyte) is really not accurate and an exaggeration
 3. C5-6 additional central disc herniation impressing CSF column with secondary mass on spinal cord, a finding not supported on these images. In fact the central area at C5-6 looks normal
 4. C6-7 "both right and left lateral osteophyte disc on complexes with disc material extending beyond the osteophyte and impinging on both nerve roots within the narrow foramina" does not describe pathology, and exaggerates disc component

C [REDACTED] C [REDACTED] Date of Birth: October 8, 1994 (23 years), "Pain status post injury"
Cervical Spine MRI May 16, 2018 @ Soul Radiology (labeled, 'C [REDACTED] C [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are very mild multilevel degenerative disc changes, characterized by mild uniform disc dehydration, very slight loss of disc height and shallow annular bulging which is developmentally normal. There is no significant osteophyte formation. The discs are otherwise normal in height, signal and morphology. There is no evidence of focal disc

(cont.) C [REDACTED] C [REDACTED] Date of Birth: October 8, 1994 (23 years)

herniation, compromise of the spinal canal, compression or displacement of the spinal cord at any level. The central spinal canal and neural foramina are widely patent at all levels. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. The nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- Agree: Straightening to Slight Reversal of Lordosis (but may be positional, not from spasm), and "the neural foramina are patent"
- DISAGREE:
 1. C3-4 central herniation impressing CSF column
 2. C6-7 "there is central disc herniation impressing on the CSF column with secondary mass effect on the spinal cord", neither of which are displayed

B [REDACTED] S [REDACTED] Date of Birth: September 25, 1955 (63 years), "Pain status post injury"
Cervical Spine MRI May 22, 2018 @ Soul Radiology (labeled, 'S [REDACTED], B [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other acute trauma. There are advanced multilevel degenerative facet joint changes. There are also advanced multilevel degenerative disc changes, characterized by substantial disc dehydration osteophyte formation, diminished disc heights, annular bulging and Modic vertebral endplate changes indicating long-standing degenerative disease. There is mild grade 1 degenerative retrolisthesis of C5 on C6. Degenerative disc changes are severe at C7-T1. There is no evidence of focal disc herniation at any cervical level. There is degenerative narrowing of the C5-6 neural foramina, right side more than left. There is mild degenerative narrowing of the left C6-7 neural foramen. There is a large right paracentral disc (protrusion) osteophyte complex which results in substantial narrowing of the right C7-T1 neural foramen. There is mild degenerative narrowing of the left C7-T1 neural foramen. There is no evidence of central spinal stenosis, significant spinal cord compression or displacement at any cervical level. The central spinal canal is patent. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- Agree: C5-6 and C7-T1 spondylosis with endplate sclerosis C7-T1. However, right and left lateral osteophyte disc complex "with disc material extending beyond the osteophyte and impinging on the nerve roots" is an exaggerated statement, as disc material is simply a part of the hypertrophic osteophyte complex, and does not represent a singular pathologic entity.
- Straightening of physiologic Lordosis (may be positional, not decisively from pain/spasm)
- DISAGREE:
 1. C4-5 central, left paramedian disc herniation impressing on the CSF column
 2. C5-6 central disc herniation impressing on the CSF column, secondary mass on spinal cord
 3. C6-7 left lateral disc herniation encroaching into the foramen and impinging the nerve root
 4. C7-T1 "there is right and left lateral osteophyte disc complex with disc material extending beyond the osteophyte and impinging on the nerve roots" does not accurately describe the pathology, and exaggerates disc component of the complex

I [REDACTED], R [REDACTED] Date of Birth: March 23, 1979 (39 years), "Pain status post injury"

Lumbosacral Spine MRI June 29, 2018 @ Soul Radiology (labeled, 'I [REDACTED], R [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild, age-appropriate degenerative facet joint changes at L4-5 and L5-S1, left side slightly more than right. There are focal and relatively isolated degenerative disc changes at L4-5 and L5-S1 characterized by disc dehydration and shallow annular bulging. The discs are relatively normal in height. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compression or displacement of the cauda equina at any level. There is mild degenerative narrowing of the L4-5 central canal and neural foramina, and left L5-S1 neural foramen. The central spinal canal and neural foramina are otherwise patent. Lordotic curvature is normal and well-preserved. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. "At L4-5 there is central disc herniation with the formative the thecal sac with its associated nerve roots. At L4-5 there is also left lateral disc herniation impinging on the nerve root at the origin of the foramen"
2. "At L5-S1 there is right lateral disc herniation impinging on the nerve root at the origin of the foramen".

H [REDACTED], E [REDACTED] Date of Birth: June 14, 1985 (33 years), "Pain status post injury"

Lumbosacral Spine MRI August 9, 2018 @ Soul Radiology (labeled, 'H [REDACTED], E [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild, age-appropriate degenerative facet joint changes mainly at L5-S1. There are very mild, age-appropriate, degenerative disc changes primarily at L3-4 and L4-5 characterized by slight disc dehydration and shallow annular bulging somewhat eccentrically toward the left. The discs are otherwise normal in signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, central spinal stenosis, compression or displacement of the cauda equina at any level. There is very mild degenerative narrowing of the left L4-5 neural foramen. The neural foramina are otherwise widely patent. Central spinal canal is also widely patent. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter, and display no evidence of compression or displacement at any level. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal. Lordotic curvature is normal and well-preserved.

➤ DISAGREE:

1. "At L3-4 there is central disc herniation impressing on the thecal sac with its associated nerve roots.
2. At L4-5 there is left lateral disc herniation encroaching into the foramen and impinging on the nerve root at the origin of the foramen"
3. "There is straightening of the physiologic lordosis consistent with pain and/or spasm".

C [REDACTED] M [REDACTED] Date of Birth: October 15, 1987 (30 years), "Pain status post injury"
Lumbosacral Spine MRI August 10, 2018 @ Soul Radiology (labeled, 'C [REDACTED] M [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, subluxation or other acute pathology. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter, and display no evidence of compression or displacement at any level. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal. Lordotic curvature is normal.

➤ DISAGREE:

1. "At L4-5 there is left lateral disc herniation encroaching into the foramen and using (sic) on the nerve root at the origin of the foramen"
2. "At L5-S1 there is (sic) central disc herniation with some inferior extension. This impression (sic) on portions of the cauda equina".

C [REDACTED] A [REDACTED] Date Birth: December 24, 1974 (43 years), "Pain status post injury"
Lumbosacral Spine MRI August 22, 2018 @ Soul Radiology (labeled, 'C [REDACTED] A [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There are localized signal changes of the L4, L5 and S1/S2 vertebrae, and possibly adjacent cauda equina, which is of indeterminate etiology, and which may reflect bone marrow abnormality, prior treatment and other etiologies. Diagnostic assessment exceeds the scope of this review and should be clinically correlated. There is no evidence of osseous trauma, fracture, contusion, dislocation, subluxation or other acute pathology. There are mild, age-appropriate degenerative facet joint changes at L3-4, L4-5 and L5-S1. Vertebral column and facet joint alignment are normal. Except for very mild degenerative change with marginal osteophyte formation, all of which is appropriate for age, the discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter, and display no evidence of compression or displacement at any level. Lordotic curvature is normal and very well-maintained.

➤ DISAGREE:

1. "At L3-4 there is left lateral disc herniation encroaching into the foramen and impinging on the nerve root at the origin of the foramen"
2. "At L5-S1 there (sic) is right lateral disc herniation causing some foraminal narrowing and abutting the nerve root".

S [REDACTED], C [REDACTED] Date of Birth: March 13, 1997 (21 years), "Pain status post injury"
Lumbosacral Spine MRI September 4, 2018 @ Soul Radiology (labeled, 'S [REDACTED], C [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, subluxation or other acute pathology. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and

(cont.) S [REDACTED], C [REDACTED] Date of Birth: March 13, 1997 (21 years)

morphology. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent at every level. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter, and display no evidence of compression or displacement at any level. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal. Lordotic curvature is normal.

➤ DISAGREE:

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm".
2. "At L4-5 there is left lateral disc herniation narrowing the neural foramen and abutting the nerve root at the origin of the foramen"

D [REDACTED] L [REDACTED] Date Birth: June 24, 1984 (34 years), "Pain status post injury"

Lumbosacral Spine MRI October 30, 2018 @ Soul Radiology (labeled, 'D [REDACTED] L [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, subluxation or other acute pathology. Vertebral column and facet joint alignment are normal. Except for slight degenerative changes with minimal osteophyte formation, which is appropriate and expected for age, the discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. There is no evidence of nerve root compression or displacement at any level. Lordotic curvature is normal and very well-maintained.

➤ DISAGREE:

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm".
2. "At L3-4 there is central disc herniation causing some flattening of the thecal sac with its associated nerve roots."
3. "At L4-5 there is left paramedian and left lateral disc herniation encroaching into the foramen and abutting the nerve root at the origin of the foramen"

S [REDACTED] G [REDACTED] Date Birth: October 16, 1989 (29 years), "Pain status post injury"

Lumbosacral Spine MRI November 14, 2018 @ Soul Radiology (labeled, 'S [REDACTED] G [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, subluxation or other acute pathology. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. There is no evidence of nerve root compression or nerve root displacement at any level. There may be slight straightening of lordosis, most probably positional. Incidentally noted are small, focal, rounded areas of signal abnormality in the L2 and L3 vertebral bodies, compatible with hemangiomas.

(cont.) S [REDACTED] G [REDACTED] Date Birth: October 16, 1989 (29 years)

➤ DISAGREE:

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm". There may be slight straightening, most probably positional, and not reflective of pain/spasm
2. "At L4-5 there is left lateral disc herniation narrowing the neural foramen and abutting the nerve root."

M [REDACTED] P [REDACTED] Date of Birth: July 29, 1965 (53 years), "Pain status post injury"

Lumbosacral Spine MRI November 26, 2018 @ Soul Radiology (labeled, 'M [REDACTED] P [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images were acquired. There is no evidence of acute fracture, contusion, or other acute pathology. There are multilevel degenerative facet joint changes which are most advanced with hypertrophic degenerative features at L4-5 and L5-S1. There are also multilevel degenerative disc changes which are most focally advanced and severe at L2-3 and L5-S1 characterized by high-grade to nearly complete loss of disc heights, substantial disc dehydration, pronounced annular bulging, hypertrophic osteophyte formation, Schmorl node formation, and extensive Modic vertebral endplate changes indicative of long-standing degenerative pathology. There is also a mild grade 1 degenerative retrolisthesis of L5 on S1. Less pronounced degenerative changes are noted at other levels. There is no evidence of focal disc herniation at any level. There is high-grade degenerative narrowing of the central canal and neural foramina at L4-5 and L5-S1. The neural foramina and central canal are otherwise relatively patent. The nerve roots have a normal appearance. The cauda equina is normal and signal in diameter. Lordotic curvature is normal. The paravertebral soft tissues demonstrate no swelling, edema or other trauma. Incidentally noted are moderately advanced degenerative disc changes of the visualized lower thoracic spine segments.

➤ AGREE: Spondylosis at L2-3 and L5-S1. L4-5 and L5-S1 central canal stenosis

➤ DISAGREE:

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm". There may be very slight straightening, most probably positional
2. "At L2-3 and L5-S1 is also anterior disc herniation with bowing of the anterior longitudinal ligaments". The anterior disc pathology is actually pronounced bulging, not herniation, and basically there is no neurological impact or sequela from anterior disc bulging or "herniation".
3. "At L2-3 there is posterior central disc herniation impressing on the CSF column with secondary mass effect on the thecal sac with its associated nerve roots".
4. At L4-5, "There is also right lateral disc herniation impinging on the nerve root at a narrowed foramen".
5. "At L5-S1 there is right and left lateral disc herniation encroaching into the foramen and impinging on the nerve root."

N [REDACTED] D [REDACTED] Date of Birth: September 6, 1977 (39 years), "Pain status post injury"

Cervical Spine MRI June 26, 2017 @ Soul Radiology (labeled, 'N [REDACTED] D [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative facet joint changes and

(cont.) N [REDACTED] D [REDACTED] Date of Birth: September 6, 1977 (39 years)

degenerative disc changes, which are somewhat more advanced at C4-5 and C5-6 than other levels, characterized by disc dehydration, shallow annular bulging, and marginal osteophyte formation. The degree of degenerative pathology is typical and expected for age. The discs are otherwise normal in appearance and display no evidence of focal disc herniation. There is no compromise of the central spinal canal, compression or displacement of the spinal cord at any level. Central spinal canal is widely patent. There is very slight degenerative narrowing of the C5-6 neural foramina. The neural foramina are otherwise widely patent at all levels. The spinal cord is normal in signal and diameter. The visualized nerve roots are normal. Lordosis is normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ AGREE:

1. C5-6 there is anterior osteophyte disc complex
2. At C5-6 and C6-7 there is "posterior disc bulging impressing on the CSF column." -----However, annular disc bulging is developmentally normal reflecting variable degrees of degenerative disc pathology, and disc bulges and herniations will frequently extend into the central spinal canal and nearly always impress the CSF column, to some degree. Any implication that such CSF impression is a significant pathologic clinical entity is misleading

➤ DISAGREE:

"There is straightening of the physiologic lordosis consistent with pain and/or spasm".

W [REDACTED] J [REDACTED] Date of Birth: June 6, 1959 (58 years), "Pain status post injury"

Cervical Spine MRI August 8, 2017 @ Soul Radiology (labeled, 'J [REDACTED]', W [REDACTED'])

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other acute trauma. Vertebral column and facet joint alignment are normal. There are multilevel degenerative facet joint changes. There are also multilevel degenerative disc changes, which are markedly advanced at C4-5 and C5-6 characterized by substantial disc dehydration, anterior and posterior osteophyte formation, substantially diminished disc heights, annular bulging and Modic vertebral endplate changes indicating long-standing degenerative pathology. Degenerative C4-5 and C5-6 spondylitic osteophyte complexes result in mild degenerative narrowing of the central spinal canal, and the neural foramina at these levels (right side more than left); C5-6 degenerative narrowing is more pronounced than C4-5. Milder degenerative narrowing of the C3-4 neural foramina is noted. There is no focal disc herniation, or spinal cord compression or displacement at any level. The central spinal canal and neural foramina are otherwise patent. Lordosis is normal. The spinal cord demonstrates a thin central linear intramedullary signal, consistent with a syrinx, but the cord diameter and signal are otherwise normal. Generalized bone marrow signal and the paraspinal soft tissues are normal.

➤ Agree:

C4-5 and C5-6 spondylosis with anterior osteophyte formation, **but** "anterior disc herniation extending beyond the osteophyte at these levels" and "some anterior disc herniation at C6-7" are exaggerated and misleading descriptive statements. Disc material is a component of the osteophyte spondylosis complex (historically termed "hard disc", and it does not represent a singular pathologic entity, as implied in the radiology report.

(cont.) W [REDACTED] J [REDACTED] Date of Birth: June 6, 1959 (58 years)

➤ DISAGREE:

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm".
2. "At C4-5 there is central and right paramedian disc herniation with narrowing of the foramen", but actually this represents disc bulging and osteophyte formation of the degenerative process.
3. "There is a linear fluid signal in the spinal cord from C4-C7. A posttraumatic syrinx is not excluded. Follow-up until resolution." I do not have the date of accident, but I presume that it was shortly before this cervical spine MRI was performed. The syrinx is most probably a chronic finding and is not acutely traumatic from a recent accident.

M [REDACTED] M [REDACTED] Date of Birth: April 29, 1971 (46 years), "Pain status post injury"
Lumbosacral Spine MRI August 21, 2017 @ Soul Radiology (labeled, 'M [REDACTED], M [REDACTED]')
Multiple axial and sagittal T1 and T2-weighted images were acquired. There is no evidence of acute fracture, contusion, or other acute pathology. There are degenerative facet joint changes which are most advanced at L4-5 and L5-S1. There are also focally advanced and relatively isolated degenerative disc changes at L5-S1 characterized by diminished disc height, disc dehydration, annular bulging, and osteophyte formation. The other discs are relatively normal in appearance. There is no evidence of focal disc herniation at any level. There is moderate degenerative narrowing of the central canal and neural foramina at L5-S1. The neural foramina and central canal are otherwise patent. The nerve roots have a normal appearance. The cauda equina is normal and signal in diameter. Lordotic curvature is normal and well-maintained. There is no swelling, edema or other paraspinal soft tissue trauma.

➤ DISAGREE:

1. "At L4-5 there is a left lateral disc herniation narrowing the neural foramen".
2. "At L5-S1 there is a central disc herniation with signal change in the herniated material consistent with annular tear. There is mass effect on the thecal sac with its associated nerve roots". There is no focal central disc herniation. Mass effect on the thecal sac results from the degenerative pathology.
3. "At L5-S1 there is also right greater than left herniation encroaching into the foramina with impingement on the right side and nerve root and abutting of the left side nerve root". There are no disc herniations, and the impingement results from the degenerative pathology, as described in my report.

J [REDACTED] J [REDACTED] Date of Birth: October 7, 1955 (61 years), "Pain status post injury"
Lumbosacral Spine MRI July 10, 2017 @ Soul Radiology (labeled, 'J [REDACTED] J [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. There are very advanced degenerative facet joint changes, mainly at L4-5 and L5-S1, affecting the left facet joints more than the right with extensive degenerative hypertrophic (osteophyte and ligamentous thickening) features. There are also multilevel degenerative disc changes which are most pronounced at L3-4, L4-5 and L5-S1 characterized by disc dehydration, annular bulging eccentrically toward the left, osteophyte formation, and probably a slight grade 1 degenerative

(cont.) J [REDACTED] J [REDACTED] Date of Birth: October 7, 1955 (61 years)

retrolisthesis of L3 on L4. There is a dextroconvex scoliosis which contributes to the asymmetrical degenerative facet joint changes. There are degenerative spondylitic disc osteophyte complexes which result in moderate narrowing of the left L4-5 and L5-S1 neural foramina and distortion of the anterior epidural space. There is no evidence of focal disc herniation at any level. The central spinal canal and neural foramina are otherwise patent at all levels. Lordosis is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- Agree: Narrowing of the left L3-4, L4-5 and L5-S1 neural foramina
- DISAGREE:
 1. L3-4, L4-5 and L5-S1 left lateral disc herniations; the pathology is clearly degenerative and very frequently encountered in patients of this age
(Failure to describe advanced degenerative pathology, disc degeneration and particularly degenerative facet joint pathology, resulting in narrowing of the neural foramina)

P [REDACTED] D [REDACTED] Date Birth: June 14, 1990 (27 years), "Pain status post injury"

Lumbosacral Spine MRI July 7, 2017 @ Soul Radiology (labeled, 'P [REDACTED] D [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, subluxation or other acute pathology. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent at every level. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. There is no evidence of nerve root compression or nerve root displacement at any level. Lordosis is normal. This MRI is normal for age.

- DISAGREE:

"At L5-S1 there is right lateral disc herniation narrowing the neural foramen and abutting the nerve root."

T [REDACTED] D [REDACTED] Date of Birth: July 4, 1961 (55 years), "Pain status post injury"

Lumbosacral Spine MRI June 16, 2017 @ Soul Radiology (labeled, 'D [REDACTED], T [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images were acquired. There is no evidence of acute fracture, contusion, or other acute pathology. There are mild, age-appropriate degenerative facet joint changes mainly at L4-5 and L5-S1. There are also multilevel degenerative disc changes most pronounced at L3-4 and L4-5 characterized by disc dehydration, prominent annular bulging, and osteophyte formation. Except for slight degenerative disc changes the other discs are relatively normal in appearance. There is no evidence of focal disc herniation at any level. There is mild degenerative narrowing of the L3-4 and L4-5 neural foramina. The neural foramina are otherwise patent. Central spinal canal diameter is normal. The nerve roots have a normal appearance. The cauda equina is normal and signal in diameter. There is very slight straightening of lordosis, probably positional. There is no swelling, edema or other paraspinal soft tissue trauma.

(cont.) T [REDACTED] D [REDACTED] Date of Birth: July 4, 1961 (55 years)

➤ DISAGREE:

1. "At L3-4 there is anterior disc herniation with bowing of the anterior longitudinal ligament."
"At L4-5 there is anterior disc herniation bowing the anterior longitudinal ligament".
2. "At L3-4 there is left lateral disc herniation narrowing the foramen and impinging on the nerve root".
3. "At L4-5 there is left lateral disc herniation narrowing the foramen and impinging on the nerve root".

(There are no disc herniations and the impingement results from the degenerative pathology, as described in my report.) Additionally, there were no anterior herniations, and disc pathology represents prominent degenerative annular bulging.

A [REDACTED] P [REDACTED] Date of Birth: December 25, 1967 (39 years), "Pain status post injury"
Cervical Spine MRI July 5, 2017 @ Soul Radiology (labeled, 'P [REDACTED], A [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial, coronal and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative facet joint changes and degenerative disc changes, which are somewhat more advanced at C4-5 and C5-6 than other levels, characterized by disc dehydration, shallow annular bulging, mildly diminished disc height and marginal osteophyte formation. The degree of degenerative pathology is typical and expected for age. The discs are otherwise normal in appearance and display no evidence of focal disc herniation. There is no compromise of the central spinal canal, compression or displacement of the spinal cord at any level. Central spinal canal is widely patent. The neural foramina are also widely patent at all levels. The spinal cord is normal in signal and diameter. The visualized nerve roots are normal. Lordosis is normal and well-maintained. There is a shallow dextroconvex scoliosis. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- DISAGREE: "At C5-C6 there is left lateral disc herniation narrowing the neural foramen and abutting the nerve root".

M [REDACTED] M [REDACTED] Date of Birth: August 11, 1994 (24 years), "Pain status post injury"
Cervical Spine MRI November 20, 2018 @ Soul Radiology (labeled, 'M [REDACTED] M [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative facet joint changes. There are also mild to moderate degenerative disc changes, which are most pronounced at C3-4, C4-5 and C5-6, characterized by disc dehydration, annular bulging, and marginal osteophyte formation. The discs are otherwise relatively normal in appearance. There is a very shallow left paracentral C3-4 superimposed disc protrusion which marginally abuts but does not compress or displace the spinal cord. There may be a very slight central protrusion of the C4-5 disc which does not abut, compress or displace the spinal cord. There is no evidence of disc extrusion, or compromise of the central spinal canal or neural foramina at any level. Central spinal canal is patent. The neural foramina are patent at all levels. The spinal cord is normal in signal and diameter. Lordosis is normal. Generalized bone marrow signal and paraspinal soft tissues are normal.

(cont.) M [REDACTED] M [REDACTED] Date of Birth: August 11, 1994 (24 years)

➤ AGREE:

At C3-4 there is a shallow left paracentral disc protrusion, and there may be a very slight central protrusion at C4-5. Disc protrusions are most frequently degenerative which is the most probable etiology, given the degree of focal degeneration at these levels.

➤ DISAGREE:

1. "There is straightening and some reversal of the physiologic lordosis consistent with pain and/or spasm".
2. There is no secondary mass effect on the spinal cord at C4-5.
3. "At C5-6 there is posterior herniation pressing on the CSF, secondary mass effect on the spinal cord."

N [REDACTED] K [REDACTED] Date of Birth: January 4, 1969 (49 years), "Pain status post injury" Lumbosacral Spine MRI May 16, 2018 @ Soul Radiology (labeled, 'N [REDACTED] K [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images were acquired. There is no evidence of fracture, dislocation, contusion, or other acute trauma. There are mild to moderate multilevel degenerative facet joint changes mainly at L3-4, L4-5 and L5-S1. There are also focal and relatively isolated degenerative disc changes at L2-3 and L4-5 characterized by disc dehydration, annular bulging eccentrically toward the right, osteophyte formation, and pronounced right sided L4-5 Modic vertebral endplate changes indicative of very long-standing degenerative pathology. Except for slight degenerative disc changes the other discs are relatively normal in appearance. There is no evidence of focal disc herniation at any level. There is very mild degenerative narrowing of the right L4-5 neural foramen. The neural foramina are otherwise widely patent. Central spinal canal diameter is normal. The nerve roots have a normal appearance. The cauda equina is normal and signal in diameter. There is very slight straightening of lordosis, probably positional. There is no swelling, edema or other paraspinal soft tissue trauma.

- AGREE: There is mild straightening of lordosis (may simply be positional)

➤ DISAGREE:

1. "There is anterior herniations (sic) bowing the anterior longitudinal ligament at L2-3, L3-4 and L4-5." In my opinion, these discs demonstrate bulging. *Anterior* herniations of discs are anatomically separate and apart and by location are not associated with nerve root or cauda equina pathology.
2. "At L2-3 there is a shallow, central and right paramedian disc herniation." (Minute increased disc signal is degenerative in nature.)
3. "At L4-5 there is right lateral disc herniation with increased signal in the herniated material consistent with annular tear." (The thin focus of increased signal in the annulus is most probably degenerative, particularly given the associated right sided advanced focal degenerative changes of the vertebral endplates).

V [REDACTED] R [REDACTED] Date of Birth: July 11, 1969 (48 years), "Pain status post injury"
Lumbosacral Spine MRI December 3, 2018 @ Soul Radiology (labeled, 'V [REDACTED] R [REDACTED]')
 Multiple axial and sagittal T1 and T2-weighted images demonstrate no fracture, dislocation, contusion, or other trauma. There are moderate multilevel degenerative facet joint changes at L4-5 and L5-S1. There are also focal, relatively isolated degenerative disc changes at L2-3 and L5-S1 characterized by disc dehydration, annular bulging, and osteophyte formation. Except for milder degenerative disc changes the other discs are normal in appearance. There is no evidence of focal disc herniation, central spinal stenosis, compression or displacement of the spinal cord at any level. The neural foramina and central spinal canal diameter are normal in diameter. The nerve roots have a normal appearance. The cauda equina is normal and signal in diameter. Lordosis is normal. The paraspinal soft tissues are normal without evidence of trauma.

➤ **DISAGREE:**

1. "At L2-3 there is anterior disc herniation causing bowing the anterior longitudinal ligament." This is diffuse and pronounced annular bulging with osteophyte complex, consistent with chronic degenerative pathology. Anterior herniations of discs are anatomically separate and apart and by location are not associated with nerve root, spinal canal or cauda equina pathology or sequela.
2. "At L4-5 there is a right lateral disc herniation narrowing the neural foramen." Both of these findings are not present.
3. "At L5-S1 there is central herniation with some inferior extension." (The increased signal in the herniated material represents degenerative pathology, very commonly encountered in degenerative disease, and best termed a fissure rather than tear). There is no evidence of cauda equina impression or compression.

R [REDACTED] B [REDACTED] Date of Birth: November 4, 1990 (27 years), "Pain status post injury"
Lumbosacral Spine MRI May 11, 2018 @ Soul Radiology (labeled, 'R [REDACTED] B [REDACTED]')
 Multiple axial and sagittal T1 and T2-weighted images demonstrate no evidence of trauma, fracture, dislocation, or other acute pathology. Facet joint and vertebral column alignment are normal. Lordosis is normal and well-maintained. The discs are normal in height, signal, morphology and overall appearance. There is no evidence of focal disc herniation, cauda equina compression or displacement at any level. The congenital diameter of the central spinal canal is slightly narrow but within normal limits. The neural foramina are widely patent. The nerve roots and cauda equina are normal in signal and diameter. The paraspinal soft tissues are normal without evidence of trauma.

➤ **DISAGREE:**

1. "At L3-4 there is left lateral disc herniation abutting the nerve root at the origin of the foramen".
2. "At L4-5 there is left lateral disc herniation impinging on the nerve root at the origin of the foramen."

S [REDACTED] G [REDACTED] Date of Birth: June 29, 1979 (39 years), "Pain status post injury"
Lumbosacral Spine MRI December 10, 2018 @ Soul Radiology (labeled, 'S [REDACTED] G [REDACTED]')
 Multiple axial and sagittal T1 and T2-weighted images demonstrate no evidence of trauma, fracture, dislocation, or other acute pathology. There are very mild degenerative facet joint changes, typical

(cont.) S [REDACTED] G [REDACTED] Date of Birth: June 29, 1979 (39 years)

for age. Facet joint and vertebral column alignment are normal. Lordosis is normal and well-maintained. There are focal and relatively isolated degenerative disc changes at L5-S1 characterized by substantial disc dehydration, annular bulging and vertebral endplates irregularity with Schmorl node formation. The discs are otherwise relatively normal in height, signal, and morphology. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent. The nerve roots and cauda equina are normal in signal and diameter. The paraspinal soft tissues are normal without evidence of trauma.

➤ DISAGREE:

1. "At L4-5 there is left lateral disc herniation narrowing the neural foramen".
2. "At L5-S1 there is central disc herniation impressing on the ventral surface of the thecal sac with its associated nerve roots."

R [REDACTED] T [REDACTED] Date of Birth: August 3, 1950 (68 years), "Pain status post injury"
Lumbosacral Spine MRI December 14, 2018 @ Soul Radiology (labeled, 'R [REDACTED] T [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no fracture or other acute trauma. There are markedly advanced degenerative facet joint changes with hypertrophic features and extensive articular surface irregularity. There are also very severe degenerative disc changes at L3-4, L4-5 and L5-S1 displaying extensive disc dehydration, nearly complete loss of disc heights, hypertrophic osteophyte formation, Schmorl node formation and grade 1 to grade 2 degenerative anterolisthesis of L3 on L4 with marked vertebral endplate irregularity, Schmorl node formation and extensive multilevel Modic vertebral endplate changes indicative of very long-standing degenerative pathology. Extensive degenerative spondylitic disc osteophyte complexes at L3-4, L4-5 and L5-S1 distort the anterior epidural space and result in moderate to high grade narrowing of the central spinal canal and associated high grade narrowing of the neural foramina at these levels, left side somewhat more than right. There is no evidence of focal disc extrusion, or other acute disc trauma. These spondylitic disc osteophyte complexes result in variable degrees of compression of the cauda equina and nerve roots at these respective levels. There are chronic atrophic changes of the paravertebral musculature particularly along the lower lumbar spine.

➤ DISAGREE:

1. "At L2-3 there is right lateral disc herniation impinging on the nerve root".
2. "At L3-4 and (sic) addition to the aforementioned spondylosis is right lateral disc herniation encroaching into the foramen and impinging on the nerve root."
3. "At L4-5 there is central herniation abutting the thecal sac"
4. "At L4-5 there is both right and left lateral disc herniations encroaching into the foramen and impinging on the nerve root"
5. "At L5-S1 there is right and left lateral osteophyte disc complex *with disc material extending down the osteophyte* and impinging on the nerve roots".

I ■ D ■ Date of Birth: September 27, 1980 (37 years), "Pain status post injury"
Cervical Spine MRI August 16, 2018 @ Soul Radiology (labeled, 'I ■ D ■')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are multilevel degenerative facet joint changes. Lordotic curvature is normal and well-maintained. There are also multilevel degenerative disc changes, which are most pronounced at C4-5, C5-6, and C6-7 characterized by disc dehydration, annular bulging, osteophyte formation, diminished disc height and slight Modic vertebral endplate changes at C6-7 indicative of long-standing degenerative pathology. Degenerative spondylitic disc osteophyte complex distorts the anterior epidural space at C5-6 and C6-7 and results in mild narrowing of the right C6-7 neural foramen. There is no evidence of disc herniation, or compression or displacement of the spinal cord. Central spinal canal is patent. The neural foramina are otherwise patent at all levels. The spinal cord is normal in signal and diameter. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

➤ DISAGREE:

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm".
2. "At C4-5 there is focal central herniation impressing on the CSF column with secondary mass effect on the spinal cord".
3. "At C5-6 the (sic) is central herniation pressing on the CSF column with secondary mass effect on the spinal cord."
4. "At C6-7 there is central herniation impressing on the CSF column. At C6-7 is also right lateral disc herniation encroaching into the foramen and impinging on the nerve root". This is all degenerative pathology, and impingement is due to degenerative spondylitic complex.

M ■ M ■ Date of Birth: February 2, 1986 (32 years), "Pain status post injury"
Lumbosacral Spine MRI October 11, 2018 @ Soul Radiology (labeled, 'M ■ M ■')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no trauma, fracture, contusion, dislocation, or other acute process. There are slight, age-appropriate degenerative facet joint changes at L4-5 and L5-S1. Facet joint and vertebral column alignment are normal. Lordosis is normal and very well-maintained. The discs are normal in height, signal, and morphology. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The neural foramina and central spinal canal are widely patent at all levels. The nerve roots and cauda equina are normal in signal and diameter. The paravertebral soft tissues are normal. Bone marrow signal is normal.

➤ DISAGREE:

1. "There is some straightening of the physiologic lordosis consistent with pain and/or spasm".
2. "At L3-4 there is left lateral disc herniation encroaching into the foramen and abutting the nerve root".
3. "At L4-5 there is right lateral disc herniation impinging on the nerve root. The origin the foramen (sic)."

F [REDACTED] F [REDACTED] Date of Birth: April 22, 1954 (63 years), "Pain status post injury"
Lumbosacral Spine MRI April 19, 2018 @ Soul Radiology (labeled, 'F [REDACTED] F [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no evidence of acute pathology, fracture, contusion, dislocation, or other trauma. Facet joint and vertebral column alignment are normal. Lordosis is normal and well-maintained. There are mild degenerative disc changes mainly at L1-2 and L4-5 characterized by shallow annular bulging, disc dehydration, and mild loss of disc height. The discs are otherwise relatively normal in appearance. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. Central spinal canal diameter is normal. There is very slight degenerative narrowing of the L4-5 neural foramina. The neural foramina are otherwise widely patent. The nerve roots and cauda equina are normal in signal and diameter. The paraspinal soft tissues demonstrate no trauma. Bone marrow signal is normal. There is a heterogeneous mass in the pelvis, but diagnostic assessment exceeds the scope of this review.

➤ **DISAGREE:**

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm".
2. "At L3-4 there is right lateral disc herniation encroaching into the foramen and abutting the nerve root at the origin of the foramen".
3. "At L4-5 there is left lateral disc herniation impinging on the nerve root within the foramen and displacing the nerve root posteriorly and superiorly within the foramen."
4. The pelvic mass does not represent a 'fibroid uterus', in this *male* patient.

B [REDACTED] W [REDACTED] Date of Birth: November 15, 1976 (41 years), "Pain status post injury"
Lumbosacral Spine MRI June 7, 2018 @ Soul Radiology (labeled, 'B [REDACTED] W [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no fracture, contusion, dislocation, or other trauma or acute pathology. There are moderately advanced degenerative facet joint changes most pronounced at L4-5 and L5-S1 with hypertrophic features. Facet joint and vertebral column alignment are normal. Lordosis is normal and very well-maintained. There are slight degenerative disc changes characterized by shallow annular bulging and minimal disc dehydration. The discs are all otherwise relatively normal in appearance. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. Central spinal canal diameter is normal. The neural foramina are patent. The nerve roots and cauda equina are normal in signal and diameter. The paravertebral soft tissues demonstrate no swelling, edema or evidence of trauma. Generalized bone marrow signal is normal.

➤ **DISAGREE:**

"L4-5 left lateral disc herniation encroaching into the foramen and abutting the nerve root at the origin of the foramen".

B [REDACTED] S [REDACTED] Date of Birth: September 18, 1974 (43 years), "Pain status post injury"
Cervical Spine MRI December 12, 2018 @ Soul Radiology (labeled, 'B [REDACTED] S [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no trauma, fracture, contusion, dislocation, or other acute pathology. Vertebral column and facet joint

(cont.) **E S** Date of Birth: September 18, 1974 (43 years)

alignment are normal and well-maintained. There are mild, age-appropriate multilevel degenerative facet joint changes. There are also mild, age-appropriate multilevel degenerative disc changes, characterized by slight disc dehydration and annular bulging, with minimal osteophyte formation. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the spinal cord at any level. Central spinal canal is widely patent. The neural foramina are also widely patent. The spinal cord is normal in signal and diameter. Bone marrow signal and paraspinal soft tissues are normal. Mild straightening of lordosis may be positional.

➤ DISAGREE:

"At C6-7 there is focal central herniation pressing on the CSF column".

K S DOB: February 17, 1994 (24 years), "Pain status post injury"
Cervical Spine MRI January 14, 2019 @ Soul Radiology (labeled, 'K S')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, marrow edema, dislocation, or other trauma. Vertebral column and facet joint alignment are normal and well-maintained. There are mild, age-appropriate multilevel degenerative disc changes from C2-3 to C5-6, characterized by slight disc dehydration and shallow annular bulging. There is no evidence of focal disc herniation, compromise of the spinal canal, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are widely patent. The spinal cord is normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal. Straightening of lordosis may simply be positional.

➤ DISAGREE:

"At C5-6 there is central disc herniation impressing on the ventral CSF column".

K B Date of Birth: May 11, 1980 (38 years), "Pain status post injury"
Lumbosacral Spine MRI January 10, 2019 @ Soul Radiology (labeled, 'K B')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no fracture, contusion, dislocation, or other trauma or acute process. Facet joint and vertebral column alignment are normal. Lordosis is normal and very well-maintained. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. Central spinal canal diameter is normal. The neural foramina are widely patent. The nerve roots and cauda equina are normal in signal and diameter. The paravertebral soft tissues demonstrate no swelling, edema or evidence of trauma. Generalized bone marrow signal is normal.

➤ DISAGREE:

"At L5-S1 there is central and right paramedian disc herniation impressing on the cauda equina and effacing the ventral surface of the thecal sac with its associated nerve roots".

M L Date of Birth: October 4, 1971 (47 years), "Pain status post injury"
Lumbosacral Spine MRI January 5, 2019 @ Soul Radiology (labeled, 'M L')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no evidence of trauma, fracture, dislocation, or other acute pathology. There are very mild, age-appropriate degenerative facet joint

(cont.) M [REDACTED] L [REDACTED] Date of Birth: October 4, 1971 (47 years)

changes at L3-4 and L4-5. Facet joint and vertebral column alignment are normal. Lordosis is normal and well-preserved. There are minimal degenerative disc changes characterized by shallow annular bulging and slight disc dehydration, all of which are appropriate for age. The discs are all otherwise relatively normal in appearance. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. Central spinal canal diameter is normal. The neural foramina are patent. The nerve roots and cauda equina are normal in signal and diameter. The paravertebral soft tissues demonstrate no swelling, edema or evidence of trauma. Generalized bone marrow signal is normal.

➤ DISAGREE:

1. "At L4-5 there is left lateral disc herniation encroaching into the foramen and impinging on the nerve root at the origin of the foramen".
2. "At L4-5 there is also right lateral disc herniation encroaching into the foramen and abutting the nerve root".

Z [REDACTED] J [REDACTED] Date of Birth: November 26, 1967 (51 years), "Pain status post injury"
Lumbosacral Spine MRI January 15, 2019 @ Soul Radiology (labeled, 'Z [REDACTED] J [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no evidence of trauma, fracture, dislocation, or other acute process. There are mild, age-appropriate degenerative facet joint changes mainly at L4-5 and L5-S1. Facet joint and vertebral column alignment are normal. Lordosis is normal. There are multilevel degenerative disc changes which are most pronounced at L5-S1 characterized by annular bulging, disc dehydration, diminished disc height, osteophyte formation and extensive Modic vertebral endplate changes indicating long-standing degenerative pathology. There is a minute focal signal in the L4-5 annulus in keeping with an annular fissure, degenerative in nature. No focal disc herniation, cauda equina compression or displacement is present at any level. There is mild degenerative narrowing of the L5-S1 neural foramina and central canal. The neural foramina and central canal are otherwise patent. The nerve roots and cauda equina are normal in signal and diameter. The paraspinal soft tissues demonstrate no swelling, edema or other evidence of trauma. Generalized bone marrow signal is normal.

➤ DISAGREE:

1. "There is straightening and reversal of physiologic lordosis consistent with pain and/or spasm".
2. "At L3-4 there is right lateral disc herniation encroaching into the foramen and abutting the nerve root".
3. "At L4-5 there is central disc herniation".
4. "At L5-S1 there is also anterior disc herniation bowing the anterior longitudinal ligament". Anterior L5-S1 disc morphology is degenerative bulging, and is not neurologically relevant.
5. "L5-S1 there is prominent posterior disc herniation deforming the thecal sac with its associated nerve roots".
6. "L5-S1 there is also right lateral disc herniation encroaching into the foramen and impinging on the nerve root". The radiology report indicates that there are three (3) L5-S1 disc herniations

C [REDACTED] G [REDACTED] Date of Birth: June 18, 1976 (42 years), "Pain status post injury"
Lumbosacral Spine MRI January 10, 2019 @ Soul Radiology (labeled, 'C [REDACTED] G [REDACTED]')
Multiple axial and sagittal T1 and T2-weighted images demonstrate no evidence of trauma, fracture, dislocation, or other acute pathology. There are very mild, age-appropriate degenerative facet joint changes mainly at L5-S1. Facet joint and vertebral column alignment are normal. Lordosis is normal. There are very mild, age-appropriate degenerative disc changes characterized by shallow annular bulging and slight disc dehydration. The discs are all otherwise normal in appearance. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the central canal, cauda equina compression or displacement at any level. Central spinal canal diameter is normal. The neural foramina are widely patent. The nerve roots and cauda equina are normal in signal and diameter. The paravertebral soft tissues demonstrate no swelling, edema or evidence of trauma. Generalized bone marrow signal is normal.

➤ DISAGREE:

1. "There is straightening of the physiologic lordosis consistent with pain and/or spasm".
2. "At L2-3 there is left lateral disc herniation narrowing the neural foramen".
3. "At L3-4 there is left lateral disc herniation narrowing the neural foramen".

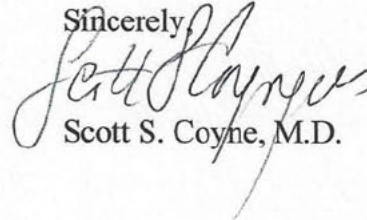
Sincerely,

Scott S. Coyne, M.D.

Exhibit B

Scott S. Coyne M.D.

File 204425-41RA3

Supplemental Expert Diagnostic Radiology Review

I have carefully performed a supplemental independent diagnostic radiology expert review of 60 additional MRI examinations, composed of 45 lumbosacral spine and 15 cervical spine studies of patients spanning the ages of 14 to 71 years. One cervical spine MRI examination was reviewed but the respective radiology report for this MRI exam could not be located, and therefore, a comparison of my opinions to those contained in the facility report was not possible, and it is, therefore, not included in this report. Accordingly, for statistical purposes, this review is composed of 59 MRI examinations. The technical quality and anatomic detail of all these MRI images were acceptable for diagnostic assessment, except in one case with some technical limitation but otherwise acceptable. The methodology of review utilized in this study was the same as my original diagnostic radiology expert review, as detailed in the March 11, 2022 summary report. Specifically, the MRI studies were randomly selected and presented for my review without any clinical medical records, description of trauma, or features of clinical presentation. My initial review of each examination consisted of a detailed assessment of all images in each study, and independent formulation of diagnostic radiology opinions. I then reviewed the respective radiology report from the facility, and recorded my specific agreement or disagreement with the opinions stated in the radiology facility report of the respective MRI exam.

All patients in this study were referred to the radiology facility for MRI assessment following trauma, with the identical clinical indication for each exam, "Indication: Pain Status Post Injury". My review of these MRI spine examinations revealed an excessive number of significant discrepancies between the anatomy displayed on the MRI images and the anatomic pathology described in the respective facility radiology report. In most cases, these discrepancies included the false positive diagnoses of central, paramedian, right and left disc herniations, and resulting nerve root abutment/impingement with encroachment/narrowing of the neural foramen/foramina and central spinal canal, and mass effect on the spinal cord or cauda equina, at specific levels.

In 55 of 59 cases my opinions substantially disagreed with the radiologic findings and resultant diagnoses contained in the facility radiology reports. I agreed fully with the facility radiologist's interpretation in only 1 case, and partially agreed in 3 cases except for minimal differences such as straightening of lordosis curvature which in likely probability would not have been expected to negatively impact patient care. In the other 55 cases the facility radiologist reported pathologic findings which were not present, and may well have adversely impacted clinical decision-making by the attending provider for therapy, and related medical/surgical care. In addition to the high number of false positive diagnoses, there were also multiple failures to describe significant underlying advanced degenerative pathology which may well have been the cause or contributed to the clinical symptoms. These failures to include descriptions of chronic significant degenerative disc and facet joint pathology, could easily mislead the attending clinician to erroneously assume that the described radiologic findings were posttraumatic in nature, particularly because all of these MRI studies were performed for symptoms following trauma.

Scott S. Coyne M.D.

--Supplemental Expert Review Continued--

As mentioned in my first report, degenerative disc and facet joint pathology is a universal condition which affects individuals to different degrees, and in most cases is basically an age-related pathologic process that progresses with age. Degenerative disc and facet joints change changes are frequently identified on MRI studies during the 3rd decade (20-30 years) as mild, age-related degenerative disease, progressing over ensuing years, and becoming moderate in the 30 and 40-year-olds, more pronounced in 50-year-olds, and often may become severe in older age groups, as a clinically significant and symptomatic condition.

To assure uniformity with my original expert report, the results of this supplemental review are divided into the following 3 main patient categories:

1. Normal MRI Examination
2. Mild Degeneration, e.g. disc dehydration, slight annular bulging, diminished disc height, compatible with age, or otherwise present
3. Moderate to Advanced or Severe Degenerative Pathology, variable degrees of annular disc bulging, disc protrusion, diminished disc height, disc dehydration, degenerative narrowing neural foramen and central spinal canal, Modic vertebral endplate change, osteophyte formation

CATEGORY 1

In Category 1 there were 14 patients with normal MRI exams. I agreed with the radiology facility report in 1 case. However in 13 other cases the radiologist reported disc herniation(s), and in 6 of the cases multiple disc herniations involving 2 or 3 levels, with resultant narrowing of the neural foramina and nerve root impingement (compression), and spinal cord/cauda equina compression in 5. Significantly, in 3 cases the patients were only 14-17 years old, but in each study the radiologist reported *multiple (2 or 3)* disc herniations with narrowing of the neural foramina and nerve root compression, and in 1 case spinal cord compression. As indicated in my initial report a herniated disc is a very infrequent if not rare finding in the teenage patient.

CATEGORY 2

In Category 2 (mild/age appropriate disc and facet joint degeneration) there were 31 cases. (No radiology report was provided in one case and, therefore, it was not included in this statistical analysis). In the other 30 cases my assessment agreed with the radiology facility report in only 2 cases, except for minimal differences which would not have been expected to negatively affect patient care.

My review of the other 28 MRI studies demonstrated degenerative disc changes, specifically no disc herniation, except for one case with a single level herniation/protrusion.

Scott S. Coyne M.D.

--Supplemental Expert Review Continued--

However, in all of these 28 MRI exams the radiologist of record reported the presence of disc herniations, and in 14/28 reported *multiple (2 or 3) disc herniations at different intervertebral levels*, and in several cases multiple disc herniations at the *same intervertebral level*.

In 2 cases the radiologist reported anterior disc herniations; as stated in my initial report, an anterior disc herniation represents exaggerated reporting of a neurologically insignificant finding. In this 28 case cohort, the radiologist also reported that the disc herniations resulted in narrowing of the neural foramina and nerve root impingement/displacement in most cases, and spinal cord/cauda equina compression in 8 cases. These represent false positive diagnoses attributed to disc herniations.

In several of these cases, there were other radiologic findings including a large cyst within the neural foramen, slight malalignment of the vertebral column, and congenital asymmetry of lumbar vertebral anatomy. There was no mention of these findings in the respective radiology reports, despite the fact that such pathology or anatomic findings could conceivably cause clinical symptoms.

CATEGORY 3

In Category 3 there were a total of 15 cases. I partially agreed with the facility radiology report in 1 case. In many of these category 3 examinations I agreed that there were degenerative findings with disc bulging, slight herniation/protrusion, narrowing of the neural foramina, etc. However, the radiologist described additional herniated discs which were not present, with neural foramina compromise, and nerve root and/or spinal cord compression. As described in the preceding categories of this review, herniated discs and related pathology were also reported at more than one intervertebral level in Category 3. Specifically, in most of these cases the radiologist reported the presence of *multiple (2 -4) disc herniations at multiple intervertebral levels in the same patient*, including several with multiple (2 or 3) disc herniations at the *same intervertebral level*. In 4 cases the radiologist reported anterior disc herniations. In the majority of these cases, the radiologist also reported that the disc herniations resulted in narrowing of the neural foramina, nerve root impingement (compression), and in 6 cases spinal cord/cauda equina compression.

Additionally, in 15/59 cases in all categories, the radiologist also described straightening of the lordotic curvature, which was not present on the images.

CONCLUSION:

My review of these cases demonstrated an excessive number of false positive diagnoses in all patient categories, including a majority of cases with multiple false positive diagnoses in the same exam. The false positive diagnoses also included exaggerated reporting of “anterior” disc herniations. Failure to describe advanced degenerative pathology is a significant omission.

Scott S. Coyne M.D.

--Supplemental Expert Review Continued--

The respective reports of these MRI examinations containing false positive diagnoses represent substantial departures from accepted standards of care in diagnostic radiology interpretation and communication.

I reaffirm my original opinions, as stated in the March 11, 2022 report, that the false positive diagnoses contained in the facility radiology reports of these cervical and lumbosacral spine MRI exams could lead to erroneous *clinical* diagnoses and related decisions, particularly in the clinical setting of trauma, and result in unnecessary further diagnostic procedures, such as EMG, nerve conduction and other diagnostic studies, as well as unnecessary treatment including decisions for pain management, interventional procedures, and even major surgery.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott S. Coyne", written in a cursive style.

Scott S. Coyne M.D.

See Appendix 1 (*File 204425-41RA3*) for detailed assessment of each MRI examination

Scott S. Coyne, M.D.
Diplomate of the American Board of Radiology

APPENDIX 1 (File 204425-41RA3)

Expert Review Interpretations of Cervical Spine and Lumbosacral Spine MRI Examinations

A [REDACTED], S [REDACTED] Date of Birth: March 14, 1958 (59 years), "Pain status post injury"
Lumbosacral Spine MRI September 28, 2017 @ Soul Radiology (labeled, 'A [REDACTED] S [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild to moderate degenerative facet joint changes from L3-4 to L5-S1. There are also mild multilevel degenerative disc changes, mainly at L4-5 and L5-S1 with slight disc dehydration and shallow annular bulging which is developmentally normal for age. Disc heights are maintained. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordotic curvature is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- L2 hemangioma (did not mention, but no clinical impact)
- DISAGREE:
 1. L4-5 left lateral disc herniation encroaching the neural foramen and abutting the nerve root at the origin of the foramen
 2. L5-S1 left lateral disc herniation narrowing the origin of the neural foramen

J [REDACTED] A [REDACTED] Date of Birth: December 4, 1995 (23 years), "Pain status post injury"
Cervical Spine MRI January 10, 2019 @ Soul Radiology (labeled, 'J [REDACTED] A [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative disc changes, slightly more pronounced at C6-7 than other levels with slight disc dehydration, minimally diminished disc height and shallow annular bulging. There is no osteophyte formation. The discs are otherwise normal in appearance. On one sagittal image, there could be an extremely small central disc protrusion or annular fissure, but this is a very marginal finding which is not identified or even suggested on any of the other imaging sequences in this examination, and is therefore, not a confirmed finding. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the spinal cord or nerve roots at any level. The central spinal canal and neural foramina are widely patent at all levels. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. The nerve roots are normal in position, signal and diameter at all levels. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- Agree: Straightening to Slight Reversal of Lordosis (but may be positional, not from spasm)
- Disagree: C6-7 central and right paramedian disc herniation impressing on the CSF column

J. [REDACTED] B. [REDACTED] Date of Birth: February 2, 1995 (22 years), "Pain status post injury"
Lumbosacral Spine MRI August 18, 2017 @ Soul Radiology (labeled, 'B. [REDACTED]', J. [REDACTED'])

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. There are mild degenerative facet joint changes from L3-4 to L5-S1. Vertebral column and facet joint alignment are normal. The discs are all normal in height, signal and morphology. There is no evidence of disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordotic curvature is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal. Incidentally noted is very robust pelvic musculature.

➤ DISAGREE:

1. L2-3 right lateral disc herniation narrowing the neural foramen and impinging on the nerve root at the origin of the foramen
2. L4-5 right lateral disc herniation narrowing the origin of the foramen and impinging on the nerve root

J. [REDACTED] B. [REDACTED] Date of Birth: December 10, 1972 (45 years), "Pain status post injury"
Cervical Spine MRI April 16, 2018 @ Soul Radiology (labeled, 'B. [REDACTED]', J. [REDACTED'])

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other acute trauma. Vertebral column and facet joint alignment are normal. There are multilevel degenerative facet joint changes. There are also multilevel degenerative disc changes, which are markedly advanced at C3-4 characterized by substantial disc dehydration, osteophyte formation, diminished disc heights and extensive Modic vertebral endplate changes indicating long-standing degenerative disease. There may be slight grade 1 degenerative retrolisthesis of C3 on C4. There is a moderate C4-5 central disc protrusion which compresses the central aspect of the spinal cord and narrows the central spinal canal. Degenerative spondylitic osteophyte complexes result in mild narrowing of the C3-4 neural foramina, and moderate narrowing of the bilateral C4-5 and right C5-6 neural foramina. There is no evidence of focal disc extrusion at any level. There is mild degenerative narrowing of the C3-4 and C4-5 central spinal canal. The central spinal canal and neural foramina are otherwise patent. Lordosis is within normal limits. The spinal cord is normal in signal and diameter. Generalized bone marrow signal is normal. There is no swelling, edema or other paraspinal soft tissue trauma.

- AGREE: C3-4 spondylosis with endplate sclerosis and anterior osteophyte disc complex, but "disc material extending beyond the osteophyte and bowing the anterior longitudinal ligaments" is exaggerated, as it is part of the osteophyte complex. It does not represent a singular pathologic entity.
- C4-5 prominent central disc herniation with inferior extrusion, significant cord flattening
- DISAGREE:
1. C3-4 central and right paramedian disc herniation with cord flattening
 2. C5-6 anterior disc herniation with bowing of the anterior longitudinal ligament. (*Anterior disc herniation, is anatomically separate and apart by location, and not associated with nerve root, spinal canal, cauda equina pathology, and is an exaggerated finding*)

J [REDACTED] B [REDACTED] Date of Birth: November 15, 1984 (33 years), "Pain status post injury"
Lumbosacral Spine MRI June 14, 2018 @ Soul Radiology (labeled, 'J [REDACTED] B [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. There are mild, age-appropriate degenerative facet joint changes mainly from L3-4 to L5-S1. Vertebral column and facet joint alignment are normal. There are focal and relatively isolated mild degenerative changes of the L5-S1 disc characterized by moderate disc dehydration, shallow annular bulging with a tiny annular fissure, and diminished disc height. The discs are all otherwise normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. Except for slight degenerative narrowing at L5-S1, the neural foramina are widely patent at all levels. Central spinal canal diameter is normal. Lordotic curvature is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. At L5-S1 there is central disc herniation with some inferior extension
2. At L5-S1 there is also left lateral disc herniation encroaching into the foramen and impinging on the nerve root

E [REDACTED] C [REDACTED] Date of Birth: October 13, 1951 (65 years), "Pain status post injury"
Lumbosacral Spine MRI August 14, 2017 @ Soul Radiology (labeled, 'E [REDACTED] C [REDACTED]')

Multiple axial, coronal and sagittal T1 and T2-weighted images were acquired. There is no evidence of acute fracture, contusion, other trauma or acute pathology. There are multilevel degenerative facet joint changes which are most advanced with hypertrophic degenerative features at L3-4, L4-5 and L5-S1. There are also multilevel degenerative disc changes which are most focally advanced and relatively severe at L3-4, L4-5 and L5-S1 characterized by high-grade loss of disc heights, substantial disc dehydration, annular bulging, osteophyte formation, and extensive Modic vertebral endplate changes indicative of long-standing degenerative pathology. There is grade 1 degenerative anterolisthesis of L3 on L4. Incidentally noted are advanced degenerative disc changes at T11-12. Less pronounced degenerative changes are noted at other levels. There is no evidence of focal disc herniation at any level. There is high-grade degenerative narrowing of the central canal and neural foramina at L3-4, and mild degenerative narrowing of the L4-5 central canal, and L4-5 and L5-S1 neural foramina, left side more than right. The neural foramina and central canal are otherwise relatively patent. The nerve roots have a normal appearance. The cauda equina is normal and signal in diameter. Lordotic curvature is normal. There is a high-grade, chronic levoconvex scoliosis which contributes to these degenerative changes. The paravertebral soft tissues demonstrate no swelling, edema or other trauma. Generalized bone marrow signal is normal.

- AGREE: Levoscoliosis, anterolisthesis of L3 on L4
 ➤ L3-4 central canal stenosis

E [REDACTED] C [REDACTED] cont.

➤ **DISAGREE:**

1. L2-3 left lateral disc herniation encroaching into the neural foramen and impinging on the nerve root
2. L4-5 central disc herniation impressing on the thecal sac with its associated nerve roots
3. L4-5 left lateral disc herniation
4. L5-S1 left lateral disc herniation. The anterior disc herniation which is described at L5-S1 is actually pronounced degenerative bulging, not herniation, and represents an exaggerated finding as there is no neurological impact or sequela from anterior disc bulging or "herniation".

F [REDACTED] C [REDACTED] Date of Birth: March 27, 1961 (56 years), "Pain status post injury"
Lumbosacral Spine MRI June 13, 2017 @ Soul Radiology (labeled, 'F [REDACTED] C [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. There are mild, age-appropriate degenerative facet joint changes at L4-5. Vertebral column and facet joint alignment are normal. There are focal and relatively isolated mild degenerative changes of the L4-5 disc characterized by moderate disc dehydration, shallow annular bulging, mild osteophyte formation and Modic vertebral endplate change indicative of long-standing degenerative pathology. The discs are all otherwise relatively normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The neural foramina are widely patent at all levels. Central spinal canal diameter is normal. Lordotic curvature is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- **DISAGREE:** L4-5 central herniation impressing on the thecal sac with its associated nerve roots. There was no mention or description of focal degenerative disc changes at this level.

J [REDACTED] C [REDACTED] Date of Birth: September 11, 1977 (39 years), "Pain status post injury"
Lumbosacral Spine MRI July 25, 2017 @ Soul Radiology (labeled, 'J [REDACTED] C [REDACTED]')

Multiple T1 and T2-weighted the axial and sagittal images demonstrate no fracture, dislocation, contusion, or other osseous trauma. (The examination is not technically optimal as axial images do not include the L5 S1 level). There are advanced degenerative facet joint changes at L4-5. Vertebral column and facet joint alignment are normal. Focal, isolated advanced degenerative disc changes are noted at L4-5 disc with substantial disc dehydration, annular bulging, anterior and posterior osteophyte formation and Modic vertebral endplate changes, all indicative of long-standing degenerative pathology. There is a moderate, central L4-5 disc protrusion/extrusion which compresses the cauda equina and narrows the central spinal canal. Substantial chronic changes of the vertebral endplates including subchondral cyst formation and osteophyte formation are noted adjacent to this disc protrusion. These findings indicate that this is a chronic disc protrusion. The other discs are relatively normal in height, signal and morphology. There is degenerative narrowing of the L4-5 neural foramina. The central canal and neural foramina are otherwise widely patent. Lordotic curvature is normal. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal, without edema, swelling or other trauma.

J [REDACTED] C [REDACTED] cont.

- AGREE: L4-5 central disc herniation with some extrusion (did not classify as chronic, however)
- DISAGREE: Straightening of physiologic lordosis consistent with pain and/or spasm

D [REDACTED] C [REDACTED] Date of Birth: December 3, 1986 (31 years), "Pain status post injury"
Lumbosacral Spine MRI April 25, 2018 @ Soul Radiology (labeled, 'D [REDACTED] C [REDACTED]')
 Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. The discs are all normal in height, signal and morphology. There is no evidence of disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordotic curvature is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- DISAGREE: L5-S1 central herniation impressing on portions of the cauda equina

C [REDACTED] S [REDACTED] Date of Birth: February 19, 1976 (42 years), "Pain status post injury"
Cervical Spine MRI March 20, 2018 @ Soul Radiology (labeled, 'C [REDACTED] S [REDACTED]')
 Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative facet joint changes. There are also mild to moderate multilevel degenerative disc changes, which are most advanced and pronounced at C4-5 characterized by disc dehydration, annular bulging somewhat eccentrically toward left, osteophyte formation, diminished disc height and mild Modic vertebral endplate change indicating long-standing degenerative pathology. Less pronounced degenerative changes are noted at other levels. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the spinal cord at any level. There is mild degenerative narrowing of the left C4-5 neural foramen. The neural foramina are otherwise patent. The central spinal canal is widely patent at all levels. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- Agree: Straightening of Lordosis (but may simply be positional, not from spasm)

DISAGREE:

1. C4-5 central disc herniation impressing CSF column, secondary mass effect on spinal cord
2. C6-7 right lateral disc herniation narrowing the neural foramen, abutting nerve root
3. C7-T1 left lateral disc herniation narrowing the neural foramen, impinging nerve root

C [REDACTED], S [REDACTED] Date of Birth: March 5, 1990 (28 years), "Pain status post injury"
Lumbosacral Spine MRI August 14, 2018 @ Soul Radiology (labeled, 'C [REDACTED], S [REDACTED]')

Multiple T1 and T2-weighted the axial and sagittal images demonstrate no fracture, dislocation, contusion, or other osseous trauma. There are moderate degenerative facet joint changes at L4-5 and L5-S1. Vertebral column and facet joint alignment are normal. Focal, isolated and advanced degenerative disc changes are noted at L5-S1 disc characterized by substantial disc dehydration, annular bulging, and osteophyte formation and mildly diminished disc height. There is a very shallow central L5-S1 disc protrusion which does not compress the cauda equina or nerve roots. There is no evidence of disc extrusion at any level. Except for very mild degenerative changes, the other discs are relatively normal in height, signal and morphology. There is slight degenerative narrowing of the L5-S1 neural foramina and central canal. The central canal and neural foramina are otherwise widely patent. Lordotic curvature is normal and well-maintained. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal, without edema, swelling or other trauma.

➤ AGREE: L5-S1 central disc herniation

➤ DISAGREE:

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. L3-4 right lateral disc herniation encroaching into the foramen and displacing the nerve root
3. L4-5 right lateral disc herniation encroaching the foramen and impinging on the nerve root

D [REDACTED] C [REDACTED] Date of Birth: April 20, 1987 (31 years), "Pain status post injury"
Lumbosacral Spine MRI June 21, 2018 @ Soul Radiology (labeled, 'D [REDACTED] C [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, or subluxation. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Very mild straightening of lordosis may simply be positional. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ Agree: Straightening of Lordosis (but is very slight and probably positional, not from spasm)

➤ DISAGREE:

1. L4-5 left lateral disc herniation impinging on the nerve root at the origin of the foramen
2. L5-S1 left paramedian focal herniation with increased signal in the herniated material consistent with annular tear... abuts the thecal sac with its associated nerve roots

D [REDACTED], N [REDACTED] Date of Birth: September 6, 1977 (39 years), "Pain status post injury"
Cervical Spine MRI June 26, 2017 @ Soul Radiology (labeled, 'D [REDACTED], N [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative disc changes, which are slightly more pronounced at C5-6 and C6-7 than other levels characterized by disc dehydration,

D [REDACTED], N [REDACTED] (cont.)

shallow annular bulging and marginal osteophyte formation. Disc heights are maintained. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is within normal limits. The spinal cord is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

DISAGREE:

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. The description of posterior disc bulging impressing the CSF column at C5-6 and C6-7, while anatomically correct, is listed as a diagnostic entity, but in fact is a typical feature of age-appropriate degenerative disc change. This is an exaggerated finding

D [REDACTED] D [REDACTED] Date of Birth: February 2, 1990 (27 years), "Pain status post injury"
Lumbosacral Spine MRI September 5, 2017 @ Soul Radiology (labeled, 'D [REDACTED], D [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no osseous trauma, fracture, contusion, marrow edema, dislocation, or subluxation. The facet joints are normal. Vertebral column and facet joint alignment is normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal and well-maintained. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- **DISAGREE:** L4-5 right lateral disc herniation narrowing the neural foramen

M [REDACTED] D [REDACTED] Date of Birth: January 29, 2001 (17 years), "Pain status post injury"
Lumbosacral Spine MRI November 7, 2018 @ Soul Radiology (labeled, 'D [REDACTED], M [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other trauma. Alignment of the vertebral column and facet joints is normal. The discs are normal in height, signal and morphology. No focal disc herniation, compression or displacement of the cauda equina, or spinal canal compromise is present at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ **DISAGREE:**

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. L3-4 right lateral disc herniation narrowing the neural foramen
3. L4-5 right lateral disc herniation narrowing the neural foramen
4. L5-S1 right lateral disc herniation encroaching into the foramen and abutting the nerve root

E [REDACTED] G [REDACTED] Date of Birth: December 31, 1987 (29 years), "Pain status post injury"
Lumbosacral Spine MRI July 24, 2017 @ Soul Radiology (labeled, 'E [REDACTED], G [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other trauma. The facet joints are normal. Alignment of the vertebral column and facet joints is normal. There are focally advanced degenerative disc changes at L2-3 and L3-4, most pronounced at the former level, characterized by loss of disc height, disc dehydration, annular bulging, osteophyte formation. There are chronic vertebral endplate changes involving the anterior superior endplates of L3 and L4 consistent with mild congenital limbus vertebrae, not related to trauma. The discs are otherwise normal in height, signal and morphology. There is no evidence of focal disc herniation, central spinal stenosis, compression or displacement of the cauda equina at any level. The neural foramina are widely patent. The central spinal canal is widely patent at all levels. Lordosis is normal. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. L5-S1 central disc herniation impressing on portions of the cauda equina

Noticeably absent in the radiology report is any description of the L2-3 and L3-4 disc and vertebral endplate abnormalities

E [REDACTED] M [REDACTED] Date of Birth: February 23, 1968 (50 years), "Pain status post injury"
Lumbosacral Spine MRI June 13, 2018 @ Soul Radiology (labeled, 'E [REDACTED] M [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other trauma. There are moderately advanced, age-appropriate degenerative facet joint changes at L4-5 and L5-S1. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal and well-maintained. There are focal, isolated advanced degenerative changes of the L3-4 and L5-S1 discs which are characterized by disc dehydration, shallow annular bulging, mild osteophyte formation and diminished disc heights. Less pronounced degenerative disc changes are noted at L4-5. The discs are otherwise normal in appearance. Incidentally noted are moderately advanced degenerative disc changes of the lower thoracic spine. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The neural foramina are widely patent at all levels. Central spinal canal diameter is normal and widely patent. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. L3-4 central herniation impressing on the CSF column and causing some flattening of the thecal sac with its associated nerve roots
2. L4-5 left lateral disc herniation encroaching into the foramen and abutting the nerve root.

The radiology report does not mention the focal degenerative disc changes, significantly involving L3-4 where the radiologist reported a 'central disc herniation'.

F [REDACTED], S [REDACTED] Date of Birth: December 21, 1967 (50 years), "Pain following MVA"
Lumbosacral Spine MRI January 8, 2018 @ Soul Radiology (labeled, 'F [REDACTED], S [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no evidence of osseous trauma, fracture, contusion, dislocation, or other acute pathology. There are moderately advanced, age-appropriate degenerative facet joint changes at L3-4, L4-5 and L5-S1. Lordotic curvature is normal and well-maintained. There are focally advanced degenerative disc changes at L4-5 and L5-S1 which are characterized by substantial disc dehydration, annular bulging, anterior and posterior osteophyte formation, high-grade loss of disc heights, vacuum disc phenomenon and grade 1 degenerative retrolisthesis of L5 on S1. Less pronounced degenerative disc changes are noted at T12-L1 and L1-2, with more advanced degenerative changes at T11-12. There is no evidence of focal disc herniation, or cauda equina displacement at any level. There is mild degenerative narrowing of the L4-5 and L5-S1 central canal and moderate narrowing of the neural foramina at these levels. The neural foramina and central canal are otherwise patent. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues demonstrate no evidence of trauma. The degree of degenerative pathology on this examination is frequently encountered in individuals of this age.

➤ DISAGREE:

1. L4-5 superimposed central disc herniation favoring the left side
2. L5-S1 superimposed central disc herniation impressing on the ventral CSF column and adjacent nerve roots favoring the left side

While the anatomic descriptions of the degenerative disc features of dehydration and diminished disc height at L4-5 and L5-S1, respectively are acceptable, the failure to mention the retrolisthesis and L5-S1 is significant, and use of the term 'herniation' is inaccurate and exaggerates the disc pathology

R [REDACTED] G [REDACTED] Date of Birth: August 31, 1992 (25 years), "Pain status post injury"
Lumbosacral Spine MRI September 22, 2017 @ Soul Radiology (labeled, 'G [REDACTED], R [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other trauma. Alignment of the vertebral column and facet joints is normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compression or displacement of the cauda equina, or compromise of the spinal canal at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal and well maintained. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. L4-5 right lateral disc herniation narrowing the neural foramen and abutting the nerve root at the origin of the foramen

N [REDACTED] G [REDACTED] Date of Birth: May 20, 1962 (56 years), "Pain status post injury"
Lumbosacral Spine MRI October 18, 2018 @ Soul Radiology (labeled, 'N [REDACTED] G [REDACTED]')

Multiple T1 and T2-weighted the axial and sagittal images demonstrate no fracture, dislocation, contusion, or other osseous trauma. There are focally advanced degenerative facet joint changes at

N [REDACTED] G [REDACTED] (cont.)

L4-5 and L5-S1. Vertebral column and facet joint alignment are normal. There are multilevel degenerative disc changes which are most focally advanced and severe at L3-4 characterized by high-grade loss of disc height, Schmorl node formation, annular bulging eccentrically toward the right, anterior and posterior osteophyte formation, and Modic vertebral endplate changes indicating long-standing degenerative pathology. There may be slight degenerative retrolisthesis of L3 on L4. The degenerative pathology results in moderate narrowing of the central spinal canal and narrowing of the neural foramina, right side more than left. Degenerative disc changes are somewhat less pronounced but are still very advanced at L1-2 and L2-3 with disc dehydration, shallow annular bulging, anterior osteophyte formation, and diminished disc height. There is no evidence of focal disc herniation at any level. The central canal and neural foramina are otherwise widely patent. Lordotic curvature is normal. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal, without edema, swelling or other trauma.

➤ DISAGREE:

1. Straightening and some reversal of physiologic lordosis consistent with pain and/or spasm
2. Anterior herniation at L2-L3 with disc material beyond the osteophyte
3. At L2-3 there is left paramedian disc herniation causing some impression on the left side of the thecal sac with its associated nerve roots
4. At L3-4 in addition to the spondylosis there is a central herniation abutting the thecal sac with its associated nerve roots
5. At L3-4 there is also right lateral disc herniation impinging on the nerve root at the origin of the foramen
6. At L4-5 there is left lateral disc herniation (?? "questions") the foramen and impinging on the nerve root

S [REDACTED] G [REDACTED] Date of Birth: October 16, 1989 (29 years), "Pain status post injury" Lumbosacral Spine MRI November 14, 2018 @ Soul Radiology (labeled, 'G [REDACTED], S [REDACTED]') Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation, other trauma or acute pathology. Vertebral column alignment is normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compression or displacement of the cauda equina, or compromise of the spinal canal at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. L4-5 left lateral disc herniation narrowing the neural foramen and abutting the nerve root

G [REDACTED] H [REDACTED] Date of Birth: December 19, 1968 (48 years), "Pain status post injury"
Lumbosacral Spine MRI September 7, 2017 @ Soul Radiology (labeled, 'H [REDACTED], G [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of acute osseous trauma, fracture, dislocation, contusion, or other acute pathology. There are advanced degenerative facet joint changes primarily at L3-4, L4-5 and L5-S1, displaying hypertrophic features. There are also advanced multilevel degenerative disc changes which are most focally pronounced and severe at L2-3 and L4-5 characterized by high-grade loss of disc height, annular bulging, anterior and posterior osteophyte formation, extensive Modic vertebral endplate changes (L2-3) indicating very long-standing degenerative pathology. There may be slight degenerative retrolisthesis of L2 on L3. There is a definitive grade 1 anterolisthesis of L4 and L5. The degenerative pathology results in mild narrowing of the central spinal canal and neural foramina at L2-3 and L4-5. (The possibility of prior surgical intervention at L4-5 on the left side is considered.) There may be a shallow right L4-5 disc protrusion, but this is an indeterminate finding. Moderate degenerative disc changes are noted at L5-S1 with disc dehydration, diminished disc height, osteophyte formation and mild Modic vertebral endplate change. There is a focal right paracentral protrusion/herniation of the L5-S1 disc which compresses the adjacent S1 nerve root and narrows the right neural foramen at this level. The central canal and neural foramina are otherwise relatively patent. Lordotic curvature is normal. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. There is no swelling, edema or other paravertebral structure trauma.

➤ Agree:

1. L2-L3 spondylosis, as described
2. L4-5 right lateral disc herniation (indeterminate finding, however)
3. L5-S1 right paramedian disc herniation compressing exiting right sided S1 nerve root

➤ DISAGREE:

1. 'Anterior herniation at L2-L3 with disc material extending beyond the osteophyte with bowing of the longitudinal ligament' is an exaggerated finding; It does not represent a singular pathologic entity.
2. At L2-3 central disc herniation causing mass effect on the thecal sac with its existing nerve roots
3. At L2-3 right paramedian and lateral orientation of herniated material impinging right-sided L3 nerve root

The failure to describe the significant degenerative pathology at L4-5 is a substantial departure, particularly in light of the possible shallow disc protrusion and narrowing of the central canal and neural foramina at this level, all of which is most probably degenerative in nature.

T [REDACTED] H [REDACTED] Date of Birth: May 11, 1942 (76 years), "Pain status post injury"
Cervical Spine MRI August 15, 2018 @ Soul Radiology (labeled, 'H [REDACTED], T [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, dislocation, or other acute osseous trauma. There are advanced degenerative facet joint changes, primarily at the lower cervical levels. There are also very severe multilevel degenerative disc changes, characterized by substantial disc dehydration, hypertrophic anterior and posterior osteophyte formation, high-grade to nearly complete loss of disc heights, extensive and severe

T [REDACTED] H [REDACTED] (cont.)

Modic vertebral endplate changes indicating long-standing degenerative disease at all levels. Grade one degenerative retrolisthesis of C5 and C6 is suspected. There is no evidence of focal disc extrusion at any level. Chronic hypertrophic spondylitic disc osteophyte complexes are noted at multiple levels which result in variable degrees of degenerative narrowing of the central canal with spinal cord compression, and narrowing of the neural foramina from C3 to C6, right side slightly more than left. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. Generalized bone marrow signal and paraspinal soft tissues are normal.

➤ Agree:

1. Diffuse spondylosis with anterior osteophyte disc complex
2. C5-C6 focal central herniation with increased signal (however, this is not a singular finding but this disc pathology is part of the degenerative complex at this level)

➤ DISAGREE:

1. C3-4 right lateral disc herniation with disc material extending beyond the osteophyte and impinging the nerve root. This description is not a diagnostic finding and does not represent a pathologic entity
2. C5-6 is a huge disc-osteophyte complex and isolating one from the other (i.e. disc from osteophyte) is really not accurate and an exaggeration
3. "C6-7 there is central and left paramedian disc herniation with disc material extending beyond the osteophyte and abutting the spinal cord" does not describe pathology, and is simply an exaggeration of features of the degenerative process
4. "C6-7 there is also left lateral disc herniation with disc material extending on the osteophyte and impinging on the nerve root". Again this is not an accepted diagnostic finding and represents an exaggeration of typical features of the degenerative process
5. "C7-T1 central disc herniation with disc material extending beyond the osteophyte and abutting of the spinal cord" is again, an exaggeration of the degenerative process

B [REDACTED] J [REDACTED] Date of Birth: April 17, 1984 (33 years), "Pain status post injury"
Lumbosacral Spine MRI June 20, 2017 @ Soul Radiology (labeled, 'J [REDACTED]', B [REDACTED'])

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild degenerative facet joint changes mainly at L5-S1. There are also mild degenerative disc changes, mainly at L4-5 and L5-S1 with slight disc dehydration, mild loss of disc height and shallow annular bulging which is developmentally normal for age. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are patent at all levels. Lordosis is normal and well maintained. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

➤ DISAGREE:

1. L4-5 right lateral disc herniation narrowing the origin of the foramen and abutting the nerve root
2. L5-S1 central disc herniation impressing thecal sac with associated nerve roots

S [REDACTED] J [REDACTED] Date of Birth: July 23, 1991 (26 years), "Pain status post injury"
Lumbosacral Spine MRI August 21, 2017 @ Soul Radiology (labeled, 'S [REDACTED]', J [REDACTED'])

Multiple T1 and T2-weighted axial and sagittal images demonstrate no fracture, marrow edema, dislocation, or other trauma. Vertebral column and facet joint alignment are normal. There are mild to moderate degenerative facet joint changes mainly at L5-S1. Except for very slight, age-appropriate degenerative changes, the discs are normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are patent at all levels. Lordotic curvature is normal. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

- DISAGREE: L5-S1 left lateral disc herniation encroaching into the neural foramen and abutting the nerve root

P [REDACTED] J [REDACTED] Date of Birth: August 5, 1976 (42 years), "Pain status post injury"
Lumbosacral Spine MRI October 29, 2018 @ Soul Radiology (labeled, 'P [REDACTED]', J [REDACTED'])

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, marrow edema, dislocation, or other osseous trauma. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal and well-maintained. There are extremely slight, age-appropriate degenerative disc changes, with slight disc dehydration and minimal annular bulging which is developmentally normal for age. There is a tiny annular fissure in the left lateral aspect of the L5-S1 disc. Disc heights are maintained. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are widely patent at all levels. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- DISAGREE:
 3. L4-5 left lateral disc herniation narrowing the foramen
 4. L5-S1 left lateral disc herniation, narrowing the neural foramen and abutting the nerve root

Z [REDACTED] J [REDACTED] Date of Birth: November 26, 1967 (51 years), "Pain status post injury"
Lumbosacral Spine MRI January 15, 2019 @ Soul Radiology (labeled, 'Z [REDACTED]', J [REDACTED'])

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. No fracture, dislocation, contusion, or other acute trauma is present. There are advanced degenerative facet joint changes primarily at L4-5 and L5-S1 with mild hypertrophic features. There are also multilevel degenerative disc changes which are most focally pronounced and severe at L5-S1 characterized by high-grade loss of disc height, extensive circumferential annular bulging, anterior and posterior osteophyte formation, pronounced Modic vertebral endplate changes indicating very long-standing degenerative pathology. Less pronounced degenerative disc changes are noted at other levels with shallow annular bulging, marginal osteophyte formation, and tiny central annular fissure at L4-5. There is no evidence of disc herniation at any level. The degenerative pathology results in mild narrowing of the central spinal canal and neural foramina at L5-S1. The central canal and neural

Z [REDACTED] J [REDACTED] (cont.)

foramina are otherwise patent. Lordotic curvature is normal. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. There is no swelling, edema or other paravertebral structure trauma. There is mild, chronic atrophy of the lower paravertebral musculature.

➤ Agree: L5-S1 spondylosis, as described

➤ DISAGREE:

1. 'L5-S1 anterior disc herniation bowing of the longitudinal ligament' is an exaggerated finding of the bulging disc; It does not represent a significant pathologic entity
2. At L5-S1 prominent posterior disc herniation deforming the thecal sac with its associated nerve roots
3. At L5-S1 there is also right lateral disc herniation encroaching into the foramen and impinging on the nerve root
4. At L3-4 right lateral disc herniation encroaching into the foramen and abutting the nerve root
5. At L4-5 there is central disc herniation with some increased signal in the herniated material consistent with annular tear, impression on ventral surface of the thecal sac with its associated nerve roots
6. Reversal of Lordosis

Although the L5-S1 spondylosis was mentioned, it was very severe, and should have been described more fully, particularly as the cause of the narrowing of the neural foramina at this level

B [REDACTED] K [REDACTED] Date of Birth: March 2, 1995 (23 years), "Pain status post injury"
Lumbosacral Spine MRI March 5, 2018 @ Soul Radiology (labeled, 'B [REDACTED] K [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no evidence of trauma, fracture, marrow edema, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. There are moderate degenerative facet joint changes at L5-S1. Except for minimal, age-appropriate degenerative changes, the discs are normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are patent at all levels. Lordotic curvature is normal and well-maintained. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE: L2-3 right lateral disc herniation encroaching into the neural foramen

T [REDACTED] K [REDACTED] Date of Birth: November 9, 1978 (39 years), "Pain status post injury"
Lumbosacral Spine MRI November 9, 2017 @ Soul Radiology (labeled, 'K [REDACTED], T [REDACTED]')

Multiple T1 and T2-weighted the axial and sagittal images demonstrate no fracture, dislocation, contusion, or other osseous trauma. There are focally advanced degenerative facet joint changes at L4-5 and L5-S1. There are also multilevel degenerative disc changes which are most focally advanced at L4-5 and L5-S1 characterized by mild loss of disc height, annular bulging with focal

T [REDACTED] K [REDACTED] (cont.)

fissures, anterior and posterior osteophyte formation, and Modic vertebral endplate changes indicative of long-standing degenerative pathology. There is a grade 1 degenerative anterolisthesis of L5 and S1. There may be slight degenerative retrolisthesis of L4 on L5 with a shallow central protrusion of the L4-5 disc, but this is an indeterminate finding. There is mild degenerative narrowing of the L4-5 central spinal canal. There is no evidence of focal disc extrusion, compression or displacement of the cauda equina at any level. The central canal and neural foramina are otherwise patent. Lordotic curvature is normal and well-maintained. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal, without edema, swelling or other trauma.

- AGREE: At L4-5 there is a central herniation, but there is no inferior extrusion. Significantly, there is no mention of the degenerative pathology at this level
- DISAGREE: At L5-S1 there is a central herniation with some superior extension, causing mass effect on portions of the cauda equina. In addition, there is no mention of the degenerative pathology or grade 1 anterolisthesis at this level, which accentuates the disc margins, frequently resulting in pseudo-herniation appearance

K [REDACTED] N [REDACTED] Date Birth: December 18, 1986 (31 years), Pain status post injury Lumbosacral Spine MRI July 3, 2018 @ Soul Radiology (labeled, 'K [REDACTED] N [REDACTED]') Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, other trauma or acute pathology. Vertebral column and facet joint alignment are normal. There are advanced degenerative facet joint changes at L5-S1. There are also mild multilevel degenerative disc changes, more pronounced at L4-5 and L5-S1 than other levels, characterized by disc dehydration, shallow annular bulging and marginal osteophyte formation. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are patent at all levels. Lordosis is normal. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

- DISAGREE:
 1. L4-5 right lateral disc herniation encroaching into the foramen and impinging on the nerve root
 2. L5-S1 central disc herniation impressing on portions of the cauda equina

K [REDACTED] P [REDACTED] Date of Birth: May 25, 1979 (39 years), "Pain status post injury" Cervical Spine MRI October 4, 2018 @ Soul Radiology (labeled, 'K [REDACTED] P [REDACTED]') Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, subluxation or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative facet joint changes and degenerative disc changes, which are characterized by disc dehydration, shallow annular bulging, slightly diminished disc height and marginal osteophyte formation. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are

K [REDACTED] F [REDACTED] (cont.)

widely patent at all levels. Lordosis is normal. The spinal cord is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

DISAGREE:

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. C3-4 left lateral disc herniation narrowing the neural foramen
3. C4-5 right paramedian disc herniation with secondary mass effect on the spinal cord
4. C6-7 central herniation impressing on CSF column with secondary mass effect on the spinal cord

M [REDACTED] K [REDACTED] Date of Birth: October 17, 1984 (34 years), "Pain status post injury"
Lumbosacral Spine MRI December 29, 2018 @ Soul Radiology (labeled, 'M [REDACTED] K [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no trauma, fracture, contusion, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal. There are mild multilevel degenerative facet joint changes. Except for mild, age-appropriate degenerative changes with slight disc dehydration, shallow annular bulging and slight Schmorl node formation, the discs are normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the spinal canal, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are widely patent. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. Paraspinal soft tissues are normal.

DISAGREE:

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. L3-4 left lateral disc herniation narrowing the neural foramen
3. L5-S1 left lateral disc herniation narrowing the neural foramen and abutting the nerve root

C [REDACTED] L [REDACTED] Date Birth: February 10, 1965 (53 years), "Pain status post injury"
Lumbosacral Spine MRI March 9, 2018 @ Soul Radiology (labeled, 'L [REDACTED], C [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, or other acute pathology. Vertebral column and facet joint alignment is anatomic. There are mild to moderate age-appropriate, degenerative facet joint changes at L4-5 and L5-S1. There are also moderate degenerative disc changes at L3-4 and L5-S1, characterized by disc dehydration, slight annular bulging, minimal osteophyte formation and Modic vertebral endplate changes indicative of long-standing degenerative pathology. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal and well-maintained. The cauda equina is normal in signal and diameter. The nerve roots are normal in signal and diameter. Incidentally noted is a well marginated 1.5 cm cyst in the right L2-3 neural foramen, consistent with a chronic perineural cyst. This cyst mildly displaces the adjacent nerve root. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

C [REDACTED] L [REDACTED] (cont.)

➤ DISAGREE:

1. L5-S1 central disc herniation impressing on portions of the cauda equina
2. L5-S1 left lateral disc herniation narrowing the neural foramen
3. The radiologist failed to report a prominent cystic mass within the right L2-3 neural foramen. As this cyst could result in neurologic symptomatology, diagnosis is important. This represents a significant oversight in the interpretation of this MRI

F [REDACTED]-G [REDACTED] L [REDACTED] Date of Birth: June 12, 1994 (24 years), "Pain status post injury"
Lumbosacral Spine MRI June 18, 2018 @ Soul Radiology (labeled, 'F [REDACTED]-G [REDACTED] L [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no evidence of fracture, marrow edema, dislocation, or other acute trauma. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal and well-maintained. There are mild multilevel degenerative facet joint changes, primarily L4-5 and L5-S1. The discs are normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, spinal canal compromise, cauda equina compression or displacement at any level. The central spinal canal is widely patent. There is minimal degenerative narrowing of the L5-S1 neural foramina. The neural foramina are otherwise widely patent. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

DISAGREE:

1. Straightening of physiologic lordosis consistent with pain and/or spasm
2. L3-4 right lateral disc herniation impinging the nerve root at the foramen origin
3. L4-5 right lateral disc herniation encroaching into the foramen and impinging on the nerve root
4. L5-S1 central disc herniation impressing on portions of the cauda equina

B [REDACTED] M [REDACTED] Date of Birth: October 4, 1971 (47 years), "Pain status post injury"
Lumbosacral Spine MRI January 5, 2019 @ Soul Radiology (labeled, 'B [REDACTED], M [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no trauma, fracture, contusion, subluxation, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal and well-maintained. There are mild to moderate, age-appropriate multilevel degenerative facet joint changes. Except for mild, age-appropriate degenerative changes with slight disc dehydration, shallow annular bulging and minimal osteophyte formation, the discs are normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, compromise of the spinal canal, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are patent. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

DISAGREE:

1. L4-5 left lateral disc herniation encroaching into the foramen and impinging on the nerve root at the origin of the foramen
2. L4-5 right lateral disc herniation encroaching into the foramen and abutting the nerve root

A [REDACTED] M [REDACTED] Date of Birth: May 19, 1994 (23 years), "Pain status post injury"
Lumbosacral Spine MRI April 30, 2018 @ Soul Radiology (labeled, 'A [REDACTED] M [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no fracture, marrow edema, subluxation, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal and well-maintained. Mild degenerative facet joint changes, are noted mainly L4-5 and L5-S1. The discs are all normal in height, signal and morphology; shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, spinal canal compromise, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are widely patent. The signal and diameter of the cauda equina and nerve roots are normal. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

DISAGREE:

L4-5 central disc herniation impressing on the cauda equina

I [REDACTED] M [REDACTED] Date of Birth: September 17, 1976 (41 years), "Pain status post injury"
Lumbosacral Spine MRI May 11, 2018 @ Soul Radiology (labeled, 'M [REDACTED], I [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, contusion, dislocation, or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild degenerative facet joint changes primarily at L4-5 and L5-S1. There are also moderately advanced degenerative disc changes at L5-S1 characterized by disc dehydration, diminished disc height, annular bulging, osteophyte formation, and left-sided Modic vertebral endplate change indicative of long-standing degenerative pathology. Less pronounced degenerative changes are noted at other levels, which are slightly more pronounced at L4-5. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are patent. Lordosis is normal and well maintained. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- **DISAGREE:** L5-S1 left lateral disc herniation encroaching into the foramen and impinging on the nerve root

P [REDACTED] M [REDACTED] Date of Birth: October 1, 1952 (65 years), "Pain status post injury"
Lumbosacral Spine MRI September 4, 2018 @ Soul Radiology (labeled, 'M [REDACTED], P [REDACTED]')

Multiple T1 and T2-weighted the axial and sagittal images demonstrate no fracture, dislocation, contusion, or other osseous trauma. There are focally advanced, hypertrophic degenerative facet joint changes at L3-4, L4-5 and L5-S1. There are also multilevel degenerative disc changes which are most focally advanced at L4-5 characterized by diminished disc height, annular bulging, anterior and posterior osteophyte formation, Schmorl node formation and extensive Modic vertebral endplate changes indicative of long-standing degenerative pathology. Less pronounced degenerative disc changes are noted out of the levels, including the lower thoracic spine. There is extensive degenerative narrowing of the L4-5 central spinal canal and neural foramina, with less pronounced narrowing of the canal and neural foramina at L5-S1. There is no evidence of focal disc herniation at any level. The central canal and neural foramina are otherwise relatively patent. Lordotic curvature is normal and well-maintained. The cauda equina and nerve roots are normal in signal and diameter. The overall bone marrow signal is heterogeneous, particularly in the sacrum and iliac bones, and the

P [REDACTED] M [REDACTED] (cont.)

possibility of neoplasia, metabolic bone disease and other etiologies should be considered; diagnostic assessment of this abnormal finding exceeds the scope of this review. The paravertebral soft tissues are normal, without edema, swelling or other trauma.

- AGREE: Spondylosis at L4-5 with some endplate sclerosis, but these changes are markedly advanced and are understated in the facility report
- DISAGREE:
 1. At L3-4 there is left lateral disc herniation encroaching into the foramen and impinging on the nerve root
 2. At L4-5 there is left lateral disc herniation
 3. At L4-5 there is central disc herniation
 4. At L4-5 there is right lateral disc herniation
 5. At L5-S1 there is a central disc herniation deforming the thecal sac/nerve roots
 6. At L5-S1 there is a left lateral disc herniation encroaching into the foramen and impinging the nerve root

Significantly, there is no mention or description of the degenerative pathology particularly at the L3-4 and L5-S1 levels with annular bulging

N [REDACTED], B [REDACTED] Date of Birth: May 24, 1995 (22 years), "Pain status post injury"

Cervical Spine MRI September 19, 2017 @ Soul Radiology (labeled, 'N [REDACTED], B [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no trauma, fracture, contusion, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. There are mild degenerative facet joint changes and very mild degenerative disc changes, which are characterized by slight disc dehydration, shallow annular bulging, and mildly diminished disc height. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. Straightening of lordosis may simply be positional. The spinal cord is normal in signal and diameter. The nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

AGREE:

1. Straightening of physiologic lordosis, but this may simply be positional
2. C4-5 bulging disc, but the bulging is minimal, is symmetric to all other levels, is not pathologic, and is appropriate for age. "Impressing on the CSF column" is not a pathologic finding, and is an amplification of a normal finding

N [REDACTED], D [REDACTED] Date of Birth: March 30, 1967 (51 years), "Pain status post injury"

Cervical Spine MRI September 17, 2018 @ Soul Radiology (labeled, 'N [REDACTED], D [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, dislocation, or other acute osseous trauma. There are multilevel degenerative facet joint changes. There are also focal, very advanced degenerative disc changes at C5-6, characterized by substantial disc dehydration, anterior and posterior osteophyte formation, annular bulging, high-

N [REDACTED], D [REDACTED] (cont.)

grade loss of disc height, and Modic vertebral endplate changes indicating long-standing degenerative pathology. Less pronounced degenerative pathology is noted at other levels, C6-7 more than others. There is no evidence of focal disc herniation, central spinal stenosis, compression or displacement of the spinal cord at any level. Chronic degenerative spondylitic complex at the C5-6 level results in mild degenerative narrowing of the neural foramina, left side slightly more than right. Straightening-reversal of lordosis appears chronic. The spinal cord is normal in signal and diameter. The nerve roots have a normal appearance. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ Agree:

1. Spondylosis with osteophyte disc complex at C5-6 and C6-7 with anterior osteophyte disc complex, disc space narrowing at C5-6
2. Straightening of physiologic lordosis, but this may simply be positional and/or chronic

➤ DISAGREE:

1. C5-6 central disc herniation impressing on the CSF with secondary mass effect on the spinal cord
2. C5-6 left lateral disc herniation encroaching into foramen and impinging nerve root
3. C6-7 left paramedian disc herniation impression on the CSF column, ("impression on the CSF column" is not a pathologic finding, and is an exaggeration/amplification of an expected degenerative finding)

M [REDACTED], P [REDACTED] Date of Birth: December 17, 1973 (43 years), "Pain status post injury" Cervical Spine MRI August 25, 2017 @ Soul Radiology (labeled, 'M [REDACTED], P [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no trauma, fracture, dislocation or other acute pathology. There are mild multilevel degenerative facet joint changes. Vertebral column and facet joint alignment are normal. There are mild to moderate multilevel degenerative disc changes characterized by disc dehydration, osteophyte formation, and shallow annular bulging. The degenerative changes are slightly more pronounced at C4-5, C5-6 and C6-7 than other levels. There is no evidence of focal disc herniation, central spinal stenosis, compression or displacement of the spinal cord at any level. The central spinal canal is widely patent at all levels. There is very mild degenerative narrowing of the C4-5 neural foramina. The neural foramina are otherwise widely patent. The spinal cord is normal in signal and diameter. The nerve roots have a normal appearance. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal. Straightening of lordosis may simply be positional.

- **Please Note:** The radiology report for this cervical spine MRI examination could not be located, and therefore, a comparison of these described radiological findings to the facility report is not possible

Z [REDACTED] R [REDACTED] Date of Birth: December 28, 1975 (41 years), "Pain status post injury"
Cervical Spine MRI August 30, 2017 @ Soul Radiology (labeled, 'Z [REDACTED] R [REDACTED]')

Multiple axial and sagittal T1 and T2-weighted images demonstrate no fracture, dislocation, or other osseous trauma. Lordosis is normal and well-maintained. There are mild to moderate multilevel degenerative facet joint changes. There are also focal, moderately advanced degenerative disc changes at C5-6, characterized by disc dehydration, anterior and posterior osteophyte formation, annular bulging with minimal fissure, diminished disc height, and Modic vertebral endplate change indicative of chronic and long-standing degenerative pathology. There may be a slight degenerative retrolisthesis of C5 on C6. Vertebral column alignment is otherwise normal. Less pronounced degenerative changes are noted at other levels. No focal disc herniation, compromise of the central canal, spinal cord compression or displacement is present at any level. The neural foramina and central spinal canal are widely patent. The spinal cord and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- DISAGREE: C5-6 central and right paramedian disc herniation with impression on the CSF column, and narrowing of the origin of the foramen

N [REDACTED] R [REDACTED] Date of Birth: December 5, 1979 (38 years), "Pain status post injury"
Lumbosacral Spine MRI May 18, 2018 @ Soul Radiology (labeled, 'N [REDACTED] R [REDACTED]')

Multiple T1 and T2-weighted the axial and sagittal images demonstrate no fracture, dislocation, contusion, or other osseous trauma. There are very advanced, hypertrophic degenerative facet joint changes at L4-5 and L5-S1. There are also markedly advanced, profound degenerative disc changes at L4-5 and L5-S1 characterized by diminished disc heights, extensive annular bulging, anterior and posterior osteophyte formation, Schmorl node formation and extensive Modic vertebral endplate changes which are indicative of long-standing degenerative pathology. Less pronounced degenerative disc changes are noted at other levels, L3-4 more than others. There is a right paracentral superimposed large protrusion/extrusion of the L4-5 disc which substantially narrows the central spinal canal and moderately compresses the cauda equina at this level. There is mild degenerative narrowing of the L3-4 and L5-S1 central canal. Except for mild degenerative narrowing at the L3-4, L4-5 and L5-S1 levels, the neural foramina are relatively patent. Lordotic curvature is within normal limits. The cauda equina and nerve roots are normal in signal and diameter. The paravertebral soft tissues are normal, without edema, swelling or other trauma. The congenital diameter of the central spinal canal is slightly narrow which does contribute to the narrowing of the central canal as described above.

- AGREE: prominent central and right paramedian L4-5 disc herniation with lobulated disc material, deformity of the thecal sac with its associated nerve roots
- DISAGREE:
 1. At L3-4 there is anterior disc herniation bowing the anterior longitudinal ligament; this is an exaggerated finding of the bulging disc at this level; it does not represent a significant pathologic entity
 2. At L3-4 there is also posterior left lateral disc herniation encroaching into the foramen and impinging on the nerve root
 3. At L4-5 there is also right lateral disc herniation impinging on the nerve root
 4. At L5-S1 there is a central disc herniation impressing portions of cauda equina

N [REDACTED] R [REDACTED] (cont.)

5. At L5-S1 there is also right lateral and left lateral disc herniations encroaching into the foramina and abutting the nerve roots
6. Significantly, there is no mention or description of the degenerative pathology particularly at the L3-4, L4-5 and L5-S1 levels with prominent annular bulging

M [REDACTED] R [REDACTED] Date of Birth: November 4, 1969 (48 years), "Pain status post injury"
Lumbosacral Spine MRI June 12, 2018 @ Soul Radiology (labeled, 'M [REDACTED] R [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, marrow edema, dislocation, or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild to moderate multilevel degenerative facet joint changes mainly at L4-5 and L5-S1. There are also mild to moderately advanced multilevel degenerative disc changes characterized by disc dehydration, annular bulging, Modic vertebral endplate change indicating long-standing degenerative disease, and osteophyte formation, possibly with a tiny right paracentral protrusion of the L5-S1 disc which does not narrow the central canal or neural foramen and does not compress the nerve root. There is no evidence of focal disc extrusion, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are patent. Lordosis is normal and well maintained. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. At L2-3 and L3-4 there is anterior disc herniation bowing the anterior longitudinal ligament; this is an exaggerated finding of the bulging discs at these levels; it does not represent a significant pathologic entity
2. At L5-S1 there is a central disc protrusion impressing on portions of the cauda equina (this finding does not reflect the extremely tiny right-sided protrusion stated above)
3. Straightening of physiologic lordosis consistent with pain and/or spasm
4. Significantly, there is no mention or description of the degenerative pathology at multiple levels including prominent annular bulging and disc dehydration

R [REDACTED], M [REDACTED] Date of Birth: February 2, 1990 (28 years), "Pain status post injury"
Cervical Spine MRI June 15, 2018 @ Soul Radiology (labeled, 'R [REDACTED], M [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no trauma, fracture, contusion, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. There are mild degenerative facet joint changes and mild degenerative disc changes, which are characterized by slight disc dehydration, shallow annular bulging, and mildly diminished disc height (C5-6). The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal. The spinal cord is normal in signal and diameter. The visualized nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

I basically agree with report except:

- DISAGREE: Straightening, reversal of physiologic lordosis consistent with pain and spasm

E [REDACTED] R [REDACTED] Date Birth: September 24, 2001 (16 years), "Pain status post injury"
Lumbosacral Spine MRI June 19, 2018 @ Soul Radiology (labeled, 'E [REDACTED] R [REDACTED]')
 Multiple T1 and T2-weighted axial and sagittal images demonstrate no fracture, marrow edema, subluxation, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal and well-maintained. The discs are all normal in height, signal and morphology. There is no evidence of focal disc herniation, spinal canal compromise, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are widely patent. The signal and diameter of the cauda equina and nerve roots are normal. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

DISAGREE:

1. At L3-4 there is right lateral disc herniation encroaching into the foramen and abutting the nerve root
2. At L4-5 there is central herniation impressing on the thecal sac with its associated nerve roots
3. At L5-S1 there is a central disc herniation impressing on the cauda equina

V [REDACTED] R [REDACTED] Date of Birth: July 11, 1969 (49 years), "Pain status post injury"
Lumbosacral Spine MRI December 3, 2018 @ Soul Radiology (labeled, 'V [REDACTED] R [REDACTED]')
 Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild to moderate multilevel degenerative facet joint changes mainly at L4-5 and L5-S1. There are also mild to moderately advanced multilevel degenerative disc changes characterized by disc dehydration, annular bulging, slight (L2-3) Modic vertebral endplate change indicating long-standing degenerative disease, and osteophyte formation, primarily involving L2-3, L3-4 and L5-S1. There is a degenerative annular fissure of the L5-S1 disc. There is no evidence of focal disc herniation, compromise of the spinal canal, compression or displacement of the cauda equina at any level. The central spinal canal and neural foramina are patent. Lordosis is within normal limits. The cauda equina and nerve roots display normal signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ **DISAGREE:**

1. At L2-3 there is anterior disc herniation causing bowing the anterior longitudinal ligament; this is an exaggerated finding of the bulging disc material at this level; it does not represent a significant pathologic entity
2. At L4-5 there is a right lateral disc herniation narrowing the neural foramen
3. At L5-S1 there is a central disc herniation with some inferior extension
4. Straightening of physiologic lordosis consistent with pain and/or spasm
5. Significantly, there is no mention or description of the degenerative pathology at multiple levels including prominent annular bulging and disc dehydration

S [REDACTED], T [REDACTED] Date of Birth: December 4, 1970 (46 years), "Pain status post injury"
Lumbosacral Spine MRI August 7, 2017 @ Soul Radiology (labeled, 'S [REDACTED], T [REDACTED]')
 Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, or other osseous trauma. Vertebral column and facet joint alignment are normal. There are mild degenerative disc changes mainly at L5-S1 characterized by disc

S [REDACTED], T [REDACTED] (cont.)

dehydration, diminished disc height and osteophyte formation. There is no evidence of focal disc herniation, compromise of the spinal canal, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal. The cauda equina and nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- DISAGREE: L5-S1 left paramedian and left lateral disc herniation narrowing the origin of the neural foramen and impinging on the nerve root

S [REDACTED], [REDACTED] Date Birth: January 30, 1986 (31 years), "Pain status post injury"
Lumbosacral Spine MRI September 19, 2017 @ Soul Radiology (labeled, 'S [REDACTED] T [REDACTED]')
 Multiple T1 and T2-weighted axial and sagittal images demonstrate no fracture, marrow edema, subluxation, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, spinal canal compromise, cauda equina compression or displacement at any level. The signal and diameter of the cauda equina and nerve roots are normal. The central spinal canal and neural foramina are patent. Lordotic curvature is normal. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

DISAGREE:

1. At L4-5 there is left lateral disc herniation encroaching into the neural foramen
2. At L5-S1 there is a central disc herniation impressing on portions of the cauda equina

E [REDACTED] S [REDACTED] Date of Birth: February 8, 1946 (71 years), "Pain status post injury"
Cervical Spine MRI October 9, 2017 @ Soul Radiology (labeled, 'S [REDACTED] H [REDACTED]')
 Multiple axial and sagittal T1 and T2-weighted images demonstrate no fracture, dislocation, or other osseous trauma. There is straightening of lordosis. There are advanced multilevel degenerative facet joint changes with mild hypertrophic features. There are also advanced multilevel degenerative disc changes characterized by disc dehydration, anterior and posterior osteophyte formation, annular bulging, diminished disc heights, and extensive Modic vertebral endplate changes indicative of chronic and long-standing degenerative pathology. There may be a slight degenerative anterolisthesis of C7 on T1. Vertebral column alignment is otherwise normal. No focal disc herniation or spinal cord displacement is present at any level. There is mild degenerative narrowing of the neural foramina from C3 to C7, right side slightly more than left, and mild degenerative narrowing of the central canal at C3-4. The neural foramina and central spinal canal are otherwise patent. The spinal cord is normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- AGREE: Diffuse Spondylosis; straightening of lordosis, but may simply be positional

- DISAGREE:

1. C3-4 posterior central disc herniation extending beyond osteophyte material causing some cord flattening

H [REDACTED] S [REDACTED] (cont.)

2. C6-7 central disc herniation extending beyond the osteophyte with the impression on the ventral CSF column
(These 2 findings are exaggerated radiologic descriptions of chronic degenerative disc bulging and osteophyte complex. The degree of this degenerative pathology is typically encountered in individuals of this age.)

A [REDACTED] S [REDACTED] Date of Birth: June 13, 1967 (50 years), "Pain status post injury"
Lumbosacral Spine MRI September 25, 2017 @ Soul Radiology (labeled, 'S [REDACTED], A [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, or other osseous trauma. Vertebral column and facet joint alignment are normal. There are markedly advanced and severe multilevel degenerative facet joint changes mainly at L3-4, L4-5 and L5-S1. There are also severe degenerative disc changes at L3-4 and L5-S1 characterized by disc dehydration, annular bulging, Modic vertebral endplate changes indicative of long-standing degenerative disease, anterior and posterior osteophyte formation, with nearly complete loss of disc heights. There is no evidence of focal disc herniation or cauda equina displacement at any level. Chronic degenerative calcified spondylitic complexes result in high-grade degenerative narrowing of the right L3-4 neural foramen, left L5-S1 neural foramen and bilateral L4-5 neural foramina. There is also degenerative narrowing of the central canal at L3-4 and L4-5. The central spinal canal and neural foramina are otherwise relatively patent. Lordosis is normal. The cauda equina and nerve roots display normal signal and diameter. Generalized bone marrow signal is normal. There are chronic atrophic changes of the paravertebral musculature primarily from L3-4 to L5-S1. The paravertebral soft tissues are otherwise normal.

➤ DISAGREE:

1. At L3-4 there is anterior disc herniation bowing the anterior longitudinal ligament; this is an exaggerated finding of the bulging disc material at this level; it does not represent a significant pathologic entity
2. At L3-4 there is a right lateral disc herniation encroaching into the foramen and impinging on the nerve root
3. At L4-5 there is left lateral disc herniation narrowing the neural foramen
4. At L5-S1 there is a central disc and left paramedian disc herniation with impression on the thecal sac with its associated nerve roots as well as impingement on the exiting S1 nerve root

Significantly, the degenerative pathology is severe, and is understated in the report

H [REDACTED] S [REDACTED] Date of Birth: January 28, 1956 (62 years), "Pain status post injury"
Lumbosacral Spine MRI November 6, 2018 @ Soul Radiology (labeled, 'S [REDACTED], H [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no fracture, contusion, dislocation, or other osseous trauma or acute pathology. There are focally advanced degenerative facet joint changes with hypertrophic features primarily at L4-5 and L5-S1. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal. There are moderate degenerative disc changes which are somewhat more advanced at L1-2, L4-5, and L5-S1 characterized by disc dehydration, slight loss of disc height, shallow annular bulging and osteophyte formation. Incidentally noted are moderately advanced degenerative disc changes of the visualized

H [REDACTED] S [REDACTED] (cont.)

lower thoracic segments. There is no evidence of focal disc herniation, cauda equina compression or displacement at any level. Except for slight degenerative narrowing at L4-5, the central spinal canal and neural foramina are patent. Lordosis is normal. The cauda equina and nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ **DISAGREE:**

1. L3-4 left lateral disc herniation with impingement on the nerve root at the origin of the foramen
2. At L4-5 right lateral disc herniation encroaching into the foramen and impinging on the nerve root at the origin of the foramen
3. At L4-5 left lateral disc herniation narrowing the neural foramen
4. At L5-S1 right lateral disc herniation impinging on the nerve root

E [REDACTED] S [REDACTED] Date of Birth: September 18, 1974 (28 years), "Pain status post injury"
Cervical Spine MRI December 12, 2018 @ Soul Radiology (labeled, 'E [REDACTED] S [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no trauma, fracture, contusion, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. There are mild multilevel degenerative facet joint changes and mild to moderate degenerative disc changes, slightly more pronounced at C6-7 than other levels, which are characterized by disc dehydration, slight annular bulging and osteophyte formation. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. Lordosis is normal. The spinal cord is normal in signal and diameter. The visualized nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- **AGREE:** Slight Straightening of lordosis, but this may simply be due to patient positioning; however, there is no reversal of physiologic lordosis
- **DISAGREE:** At C6-7, there is focal central herniation pressing on the CSF column

J [REDACTED] S [REDACTED] Date of Birth: November 2, 1958 (60 years), "Pain status post injury"
Lumbosacral Spine MRI December 3, 2018 @ Soul Radiology (labeled, 'S [REDACTED], J [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of osseous trauma, fracture, contusion, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. There are markedly advanced and severe multilevel degenerative facet joint changes with hypertrophic features mainly at L2-3, L3-4, L4-5 and L5-S1. There are also markedly advanced degenerative disc changes which are most pronounced and severe at L5-S1 characterized by substantial disc dehydration, annular bulging with a very shallow central disc protrusion with annular fissure, profound Modic vertebral endplate changes indicative of long-standing degenerative disease, anterior and posterior osteophyte formation, and nearly complete loss of disc height. Less pronounced degenerative disc changes are noted at other levels. There is no evidence of focal disc extrusion or cauda equina displacement at any level. There is moderate

J [REDACTED] S [REDACTED] (cont.)

degenerative narrowing of the L4-5 central canal and neural foramina, with more moderate narrowing of the neural foramina at L3-4. The central spinal canal and neural foramina are otherwise relatively patent. Lordosis is normal and well-maintained. There is a dextroconvex scoliosis. The cauda equina and nerve roots display normal signal and diameter. Bone marrow signal is normal. There are chronic and pronounced atrophic changes of the paravertebral musculature primarily at from L4 to S1. The paravertebral soft tissues are otherwise normal, without swelling, edema or other trauma. Incidentally noted are very advanced degenerative disc changes at T10-11 to T11-12.

➤ DISAGREE:

1. There is anterior disc herniation at L2-3, L3-4 and L4-5 with bowing of the anterior longitudinal ligament; this is an exaggerated description of bulging disc material at these levels, and does not represent significant pathologic entities
2. At L2-3 there is a left lateral disc herniation encroaching into the foramen and impinging on the nerve root
3. At L3-4 there is right lateral disc condition collection (sp?) to the foramen and impinging on the nerve root
4. At L4-5 there is central herniation with some increased signal in the herniated material consistent with annular tear. There is impression on the thecal sac with its associated nerve roots
5. At L5-S1 there is a central disc herniation with impression on the cauda equina and thecal sac with its associated nerve roots

Significantly, the degenerative pathology is extensive and focally severe, which may well be clinically significant, and is not described in the facility report

T [REDACTED] O [REDACTED] Date of Birth: November 16, 1977 (40 years), "Pain status post injury" Cervical Spine MRI October 11, 2018 @ Soul Radiology (labeled, 'T [REDACTED], O [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of trauma, fracture, dislocation, contusion or other acute pathology. Vertebral column and facet joint alignment are normal. Lordotic curvature is normal. There are mild degenerative disc changes, mainly at C4-5 and C5-6 characterized by disc dehydration, shallow annular bulging and minimal osteophyte formation. Disc heights are relatively well preserved. The other discs are normal in appearance. There is no evidence of focal disc herniation, spinal canal compromise, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. The spinal cord is normal in signal and diameter. The visualized nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

➤ DISAGREE:

1. There is straightening of the physiologic lordosis consistent with pain and/or spasm
2. At C4-5, there is central herniation impressing on the CSF column with secondary mass effect on the spinal cord
3. At C5-6, there is central herniation impressing on the CSF column with secondary mass effect on the spinal cord

Significantly, there is no description of the degenerative disc pathology in the facility report

V [REDACTED], E [REDACTED] Date Birth: August 30, 1988 (29 years), "Pain status post injury"
Lumbosacral Spine MRI June 8, 2018 @ Soul Radiology (labeled, 'V [REDACTED], E [REDACTED]')

Multiple T1 and T2-weighted axial and sagittal images demonstrate no fracture, marrow edema, subluxation, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, spinal canal compromise, cauda equina compression or displacement at any level. The signal and diameter of the cauda equina and nerve roots are normal. The central spinal canal and neural foramina are patent. Lordotic curvature is normal. Generalized bone marrow signal is normal. The paraspinal soft tissues are normal.

DISAGREE: At L5-S1 there is some right lateral disc herniation encroaching into the foramen with secondary displacement of the nerve root

W [REDACTED], D [REDACTED] Date of Birth: September 18, 1993 (23 years), "Pain status post injury"
Cervical Spine MRI July 10, 2017 @ Soul Radiology (labeled, 'W [REDACTED], D [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of trauma, fracture, marrow edema, dislocation, or other acute pathology. Vertebral column and facet joint alignment are normal. There are very slight degenerative disc changes, primarily at C3-4 displaying minimal disc dehydration and slight annular bulging, typical for age. The discs are otherwise normal in appearance. There is no evidence of focal disc herniation, compromise of the spinal canal, spinal cord compression or displacement at any level. The central spinal canal and neural foramina are widely patent at all levels. There is straightening of the normal lordotic curvature. The spinal cord is normal in signal and diameter. The visualized nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- AGREE: Straightening of lordosis, but this may simply be due to patient positioning; however, there is no significant reversal of physiologic lordosis
- DISAGREE: At C4-5, there is some right lateral disc herniation narrowing the neural foramen

W [REDACTED], M [REDACTED] Date of Birth: July 8, 1995 (22 years), "Pain status post injury"
Lumbosacral Spine MRI September 5, 2017 @ Soul Radiology (labeled, 'W [REDACTED], M [REDACTED]')

Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of trauma, acute fracture, contusion, dislocation, or other acute pathology. There are focally advanced degenerative facet joint changes at L4-5 and L5-S1. There is congenital bilateral spondylolysis of L5, with resultant slight grade 1 spondylolisthesis of L5 on S1. There are resultant mild to moderate focal L5-S1 degenerative disc changes characterized by some loss of disc height, disc dehydration, shallow annular bulging and marginal osteophyte formation. The other lumbar discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The central spinal canal and neural foramina are patent. Lordosis is normal. The cauda equina and nerve roots are normal. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

- DISAGREE: At L4-5 there is left lateral disc herniation narrowing the neural foramen and abutting the nerve root. L5 spondylolysis, although subtle, was not mentioned in the report

W [REDACTED], M [REDACTED] Date of Birth: April 13, 1998 (20 years), "Pain status post injury"
Lumbosacral Spine MRI May 14, 2018 @ Soul Radiology (labeled, 'W [REDACTED], M [REDACTED]')
Multiple T1 and T2-weighted images were acquired in the axial and sagittal planes. There is no evidence of fracture, marrow edema, dislocation, or other acute pathology. There are focally advanced degenerative facet joint changes at L5-S1, with slight congenital asymmetry of the posterior elements, which is a frequently encountered spine anomaly. There are mild focal L5-S1 degenerative disc changes characterized by disc dehydration and marginal osteophyte formation. The other lumbar discs are normal in height, signal and morphology. Shallow annular bulging is developmentally normal. There is no evidence of focal disc herniation, central spinal stenosis, cauda equina compression or displacement at any level. The central spinal canal is patent. There is very slight degenerative narrowing of the L4-5 and L5-S1 neural foramina. The neural foramina are otherwise patent. Lordosis is normal and well-maintained. The cauda equina and nerve roots are normal in signal and diameter. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal. There appears to be a shallow dextroconvex scoliosis.

➤ DISAGREE:

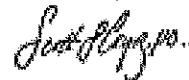
1. At L4-5 there is left lateral disc herniation with some increased signal material consistent with annular tear. There is impingement on the nerve root at the origin of the foramen
2. At L5-S1 there is central disc herniation impinging on the epidural fat and portions of the cauda equina

Z [REDACTED], S [REDACTED] Date Birth: March 15, 2004 (14 years), "Pain status post injury"
Lumbosacral Spine MRI May 2, 2018 @ Soul Radiology (labeled, 'Z [REDACTED], S [REDACTED]')
Multiple T1 and T2-weighted axial and sagittal images demonstrate no fracture, contusion, marrow edema, subluxation, dislocation, or other acute trauma or pathology. Vertebral column and facet joint alignment are normal. The discs are normal in height, signal and morphology. There is no evidence of focal disc herniation, compromise of the central spinal canal, cauda equina compression or displacement at any level. The signal and diameter of the cauda equina and nerve roots are normal. The central spinal canal and neural foramina are widely patent. Lordosis is normal and well-maintained. Generalized bone marrow signal is normal. The paravertebral soft tissues are normal.

DISAGREE:

1. At L3-4 there is right lateral disc herniation encroaching into the foramen and impinging on the nerve root
2. At L4-5 there is right lateral disc herniation encroaching into the foramen and impinging on the nerve root

Sincerely,



Scott S. Coyne, M.D.

Exhibit C

EXPERT REPORT OF DR. BRYAN PUKENAS

I am an Associate Professor of Radiology and Neurosurgery at the University of Pennsylvania. I am a board-certified radiologist with a certificate of added qualification in Diagnostic Neuroradiology. In addition, I hold a CAST accreditation in CNS Endovascular Surgery. I am also Co-Director of the Neurointerventional Endovascular Fellowship at the University of Pennsylvania. My daily clinical practice consists of performing minimally invasive procedures of the brain and spine, as well as image interpretation, including but not limited to brain and spine Magnetic Resonance Imaging (MRI) examinations. I also teach residents and fellows in both didactic and one-on-one sessions. I have lectured and published academic works on a wide range of subjects about radiology and the practice of radiology both in the United States and internationally. My training and experience offer a unique insight as both a diagnostic radiologist interpreting MRI examinations and as a clinician treating patients with lumbar and cervical spine pain. As part of my work, I conduct peer reviews of other radiologists' work in both an academic and clinical setting. I have provided opinions on radiological practice in numerous cases and have been engaged by both plaintiffs and defendants. Pursuant to Fed. R. Crim. P. 16(b), my CV is attached as Exhibit A and a list of cases in which I have testified as an expert at trial or by deposition in the past four years is attached as Exhibit B.

I was asked by counsel for the Defendant, Dr. William Weiner, to offer opinions on standards and practices in radiology. I was also asked to examine independently each of the radiological examinations and reports that Dr. Weiner conducted of the persons identified in the Report and Supplemental Report of Dr. Scott S. Coyne, and to assess independently Dr. Coyne's evaluations of Dr. Weiner's reports (including his methodology). Finally, I was asked to offer my opinion as to whether Dr. Weiner's work in these cases was consistent with the standard of care for a radiologist.

Key Findings

As requested, I reviewed the original MRIs and Dr. Weiner's interpretive reports for the patients included in Dr. Coyne's review,¹ as well as Dr. Coyne's Report and Supplemental Report. Unlike Dr. Coyne, I also considered the clinical information available to Dr. Weiner at the time he conducted the initial reads for these patients.

I found Dr. Weiner's reports in these cases to be within the standard of care for radiologists. Further, in my review of Dr. Weiner's reports, I did not see evidence of a pattern of overreporting or exaggerating findings.²

¹ I was unable to obtain readable images for the following patients reviewed in Dr. Coyne's Report: D.D.; S.J.; Z.J.; M.K. For these patients I reviewed Dr. Coyne's reported findings. The absence of these images does not change the substance of my opinions in this case.

² As I explain further below, academic studies show that radiologists often disagree regarding particular findings when reading MRIs (and that radiologists often disagree with themselves when reading the same scan at different times). Here, although I disagreed with some of Dr. Weiner's findings, our level of disagreement was consistent with that which is reported in the literature and in line with my own experience as a practitioner. Further, to the extent that I

Different radiologists often interpret the same scan in different ways. A particular image may have multiple different characteristics that can be interpreted as “findings” of greater or lesser medical significance. As a matter of general practice, radiologists should report both major and minor findings in their reports in order to provide treating physicians with as much information as possible. That said, there are still variations in terms of how sensitive and specific a radiologist will be when detecting and describing findings that should be included in a report. That variation is evident in comparing Dr. Coyne’s reads to Dr. Weiner’s. My overall assessment of their work is that they have differing sensitivity to reporting certain findings in addition to different styles of reporting those findings.

In my opinion, Dr. Weiner’s practice of describing findings is consistent with the standard of care. In addition, the records provided to me reflect that he had access to clinical data when reviewing the scans. As discussed below, studies show that when radiologists have clinical data available to them when interpreting imaging, their overall rate of sensitivity to findings increases. Based on my review of the data, Dr. Weiner’s reads are consistent with ordinary radiological practice, even though I do not agree with all of his findings.

Dr. Weiner’s use of clinical data appears to have resulted in more appropriate diagnoses in certain instances. For example, in one case of a 16-year-old girl reporting lower back pain, N.B., Dr. Weiner’s use of clinical data likely led him to find and report an issue that both Dr. Coyne and another radiologist in Dr. Weiner’s office missed. In my opinion, this was an excellent read. It should be noted, however, that even though Dr. Weiner made an impressive finding in this instance, he actually also *underreported* the findings present in the scan. My review of the scan also detected an asymmetry in the psoas muscles surrounding the spine. In the scan, the left psoas muscle is oval-like in appearance whereas the right psoas muscle has a more rounded appearance. The rounded configuration of the psoas muscle can occur when the muscle is contracted, or flexed, and can occur when there is irritation and/or spasm from an injury. The additional finding of the right psoas muscle spasm supports the findings identified by Dr. Weiner.

In contrast to Dr. Weiner’s use of clinical data, Dr. Coyne stated in his report that he did not review or consider clinical information on the patients whose images were presented to him for his review. Clinical information on a patient’s condition is an important part of interpreting diagnostic images in radiology. It is my experience, supported by the literature in the field of radiology, that consideration of patient clinical data prior to interpreting an image leads to better

disagreed with Dr. Weiner, it was because, in nearly equal numbers, Dr. Weiner: (i) made findings that I would not have reported; or (ii) failed to make findings that I would have reported (for example, Dr. Weiner consistently failed to report findings suggesting degeneration relating to the facet joint—a set of conditions that could cause pain, particularly if aggravated by trauma). Similarly, I disagreed with Dr. Coyne’s findings both because he made findings that I would not have reported and because he failed to make findings that I would have. I should note that, in some instances, Drs. Weiner and Coyne both failed to identify findings that I would have made, such as in the case of patient E.H., who has a transitional lumbosacral vertebral segment on the left, a finding that can cause significant pain (Bertolotti syndrome), particularly after trauma. The following link describes this scenario: <https://www.summitbrainandspine.com/emy-story>. Finally, I noted that Dr. Coyne’s findings were inconsistent across the cases that he read more than once.

interpretations which, in turn, leads to more accurate diagnoses for patients. It is more likely that a physician will miss or underreport key findings when the patient's clinical history is not provided. Dr. Coyne's failure to report findings in certain cases might have prevented treatment for conditions that can cause significant pain to patients. In the case of the 16-year-old patient, N.B., with a herniated disc, Dr. Coyne appears to have relied on his general assessment that "a herniated disc is an extremely rare finding in a 16-year-old patient." That is true, but herniated discs do occur in this patient population, and this patient does appear to have one. Dr. Coyne would have been more likely to catch that had he considered the patient's clinical history.³

Dr. Coyne and Dr. Weiner have different reporting styles, including as it relates to causation or etiology. Dr. Coyne notes that certain findings were caused by pre-existing conditions or age-related degeneration (as opposed to trauma from an accident).⁴ In my practice, I typically report only the anatomical findings and avoid commenting on the etiology of findings that appear in a diagnostic scan. Likewise, as a treating physician, I prefer reports that include only anatomical findings and omit opinions regarding causation. Without understanding the clinical history and circumstances, it would be difficult for a radiologist to evaluate whether an imaging finding (traumatic, degenerative, or otherwise) is the etiology of a patient's pain. As discussed above, a pre-existing injury might be exacerbated by a traumatic event. By contrast, Dr. Weiner's reports do not comment on the etiology of his findings, which, as described above, is consistent with my practice.

The stylistic reporting differences between Dr. Weiner and Dr. Coyne is evident for patient "W.J." Dr. Weiner correctly found a syrinx (a type of spinal cyst) in the scan. Dr. Weiner's report states: "A posttraumatic syrinx is not excluded. Follow-up until resolution." From the notes, it appears that Dr. Weiner is not rendering a conclusion as to the cause of an injury; rather a post-traumatic syrinx is included in the differential diagnosis for this finding, but he is not categorically excluding trauma as a cause. Dr. Coyne, on the other hand, does render a conclusion as to the cause of the injury. Dr. Coyne admits that he neither has the patient's clinical data, nor does he "have the date of the accident," but still concludes that the syrinx "is most probably a chronic finding and is not acutely traumatic from a recent accident."

Dr. Coyne's description of the etiology of injury sometimes has the effect of minimizing findings that may be of clinical significance.⁵ For example, for patient T.H., I disagree with Dr. Coyne's description of the spinal cord as "normal" in signal and caliber. The patient's spinal cord is not normal in caliber. In addition, because there are Modic degenerative changes, the bone marrow, by definition, is not normal in signal. In another patient, D.N., Dr. Coyne ascribes chronicity to the findings, which, in my opinion, is impossible to determine on the basis of the image.

³ In the case of Patient S.Z., without any clinical history aside from what is provided in the radiology report, Dr. Coyne speculates that straightening of cervical lordosis "may be positional and not from spasm." Straightening of cervical lordosis may be secondary to pain, spasm, or positioning. There is no way to categorically deny any of these possibilities without the patient's clinical history.

⁴ *E.g.*, S.Z., E.H.

⁵ *E.g.*, S.Z., D.N. (51 y/o), H.S., T.H., V.R.

Furthermore, I disagree with Dr. Coyne's characterization of certain findings. For example, Dr. Coyne makes a finding of various degrees of "annular bulging," which he describes as "developmentally normal" in his findings for multiple patients.⁶ "Developmentally normal" disc bulging never occurs.

In other instances, Dr. Coyne criticizes Dr. Weiner for his use of certain terminology that has the same meaning as the term Dr. Coyne prefers. For example, for patient V.R., Dr. Coyne states that Dr. Weiner's read that the scan shows an "annular tear" is incorrect and states that there is an "annular fissure" present instead. This is semantics. A tear and a fissure describe the same condition. Annular Disc Tear. Steven Tenny; Christopher C. Gillis. Treasure Island (FL): StatPearls Publishing; 2023 Jan.⁷

In rendering both conclusory determinations about cause and in failing to consider patient clinical information, it is my opinion that Dr. Coyne's methodology is inappropriate. If used in a clinical setting, Dr. Coyne's approach would likely lead to reports that are more confusing and less useful for patients and treating physicians.

Standards and Practices in Radiology

A radiologist is a medical doctor who uses imaging (X-ray, CT, MRI, etc.) to "look inside the body" and diagnose disease. Radiologists are often referred to as "doctors' doctors"; by using imaging, they help other physicians detect and confirm clinical suspicions or suspected diagnosis. This is called clinical correlation – correlating imaging findings to support or refute a suspected diagnosis. One of the most powerful tools in the imaging armamentarium of radiologists is Magnetic Resonance Imaging (MRI). MRI can non-invasively look inside the body and differentiate bodily structures in a unique way, such as showing the spinal nerves, disks, and degenerative changes in a lumbar spine. Correctly interpreting MRI examinations takes years of training.

Even experienced radiologists can and do have differing opinions when it comes to interpreting MRI examinations. For example, one study found that, when interpreting cervical spine MRIs, absolute inter-rater agreement can range from 54.6% to 95%. *The Spine Journal* 16 (2016) 42-48. In layman's terms, this means that when different radiologists interpret the same MRI scan, their findings can differ up to 54.6% of the time. In another study, in which 10 different radiologists read MRIs from the same patient, researchers found high levels of variability and high rates of interpretive errors in the reported interpretive findings. *The Spine Journal* 17 (2017) 554-561. "The fact that no interpretive finding was reported unanimously by the radiologist at all centres and that one-third of all reported findings only appeared once across all 10 study examination reports indicates that there is at best significant difference in the standards employed by radiologists...and at worst significant prevalence of interpretive errors."

⁶ E.g., S.Z., S.M. (27 y/o), C.C., R.I.

⁷ Relatedly, in several instances, Dr. Weiner reported a disc "herniation" where I would have reported a disc "bulge." This difference may be the product of training. Historically, variable terms have been used to describe disk pathology, including herniation and bulging. More recently, there has been a movement towards using a standardized lexicon when describing disk pathology.

<https://spinalnewsinternational.com/alarmingly-high-number-of-interpretive-errors-and-inconsistencies-in-mri-examinations/>.

Errors, discrepancies and confounding biases are integral parts of the daily routine for radiologists and can cause various unexpected clinical consequences. It is obvious that radiological assessment of imaging examinations is a part of overall patient management that may be limited due to the diagnostic utility of the imaging technique and referral information. Therefore, radiological reports should not be expected always to be complete and correct or be regarded as the only tool to identify, confirm, or exclude the diagnosis [1, 3]. Onder, O., Yarasir, Y., Azizova, A. et al. Errors, discrepancies and underlying bias in radiology with case examples: a pictorial review. *Insights Imaging* 12, 51 (2021).

Once radiologists observe findings, they must communicate these findings in a formal report as part of the medical record. Compared with the systematic accumulation of medical facts that pertain to the practice of radiology, crafting a radiology report is a more artisanal, reflective, and creative process. The complex relationship among the patient, treatment team, and radiologist also contributes to patterns of problematic reporting. Radiologists frequently have to interpret an imaging study with limited clinical data and without the opportunity to personally assess the patient. Despite the ordering provider's expectation for the radiologist to deliver a clear answer to the clinical question, a definitive diagnosis may be out of reach because of inherent limitations of the modality, imaging findings that lack specificity, or even technical inadequacies of the study. Some radiologists may be tempted to cope with this uncertainty by simply restating findings, employing excessive qualifying language, shifting responsibility back to the ordering provider, or providing vague recommendations (9,10) *RadioGraphics* 2020; 40:1658–1670. It should be noted that terminology in radiological reporting is sometimes inconsistent and certain radiologists tend to favor certain terms over others (e.g., using the word “tear” over the word “fissure”). In today's world, where patients have almost immediate access to their medical record, radiologists are encouraged to utilize fewer technical terms in favor of more commonly used language that can be understood by patients.

Despite inherent variability in the structure and content of radiology reports, it has been shown that the addition of clinical information improves sensitivity of reporting, increasing from 38% to 84%, 67% to 73% and 38% to 52%. *J Med Radiat Sci* 68 (2021) 60–74.⁸ Put differently,

⁸ The context in which a radiologist is reviewing an image may also influence results. For example, while use of clinical data in reading images is preferable, there is literature suggesting it can lead to “framing bias,” which, for radiologists, “commonly results from the influence that the clinical history or reason for examination has on image interpretation.” See Jason N. Itri and Sohil H. Patel, *Heuristics and Cognitive Error in Medical Imaging*, *American Journal of Roentgenology* (March 12, 2018), <https://ajronline.org/doi/10.2214/AJR.17.18907>. Framing bias may also help to explain some of the differences of opinion between me and Drs. Weiner and Coyne, respectively. Dr Weiner interpreted these MRIs in a clinical context where patients complained of pain following trauma. Dr. Coyne interpreted these MRIs after the fact, without clinical data, at the request of law-enforcement authorities. I interpreted these MRIs after the fact, with the benefit of clinical data, at the request of defense counsel. These differing contexts

these statistics indicate that patient-specific clinical information allows a radiologist to make more accurate and clinically relevant diagnoses. The standard of care for reporting of findings is such that all clinically significant findings must be reported. Failure to report findings could result in denial of care to a patient in need. Usually, major findings are summarized in the “Impression” section of a report, but it is not uncommon for individual radiologists to include both major and minor findings in this same section of the report.

When a radiologist receives additional clinical information indicating that they may have missed certain findings, the normal course is to review the scan. Whether this review is performed by the original radiologist or a new radiologist is often a matter of practice preference for a specific doctor or institution. There is nothing *per se* unusual about a practitioner re-reading a scan and providing an addendum.

It is uncommon in my daily practice for radiologists to opine on the cause or severity of pain or injury. For example, I typically do not make assumptions in my reports indicating whether a particular finding was caused by a specific traumatic incident. These determinations are beyond the scope of a typical report – and for good reason. Radiologists rarely have access to the type of information – even if they are relying upon clinical data – to determine whether an injury was caused or exacerbated by a specific event or even if the imaging findings existed prior to the event precipitating the scan.

Date: December 22, 2023



Bryan Pukenas, M.D.

Attachments: **Exhibit A** – *Curriculum Vitae*; **Exhibit B** – List of Testimony

are important because the literature suggests that radiologists have a tendency to be influenced by how a question is asked or how a problem is presented. *Id.*